SOLO ACROSS THE ARCTIC

FLYING

THE WORLD'S MOST WIDELY READ AVIATION MAGAZINE

AUGUST
50¢

BEECHCRAFT SUPER 18
OVER OKLAHOMA CITY

CANADA'S FLY-IN FISHING

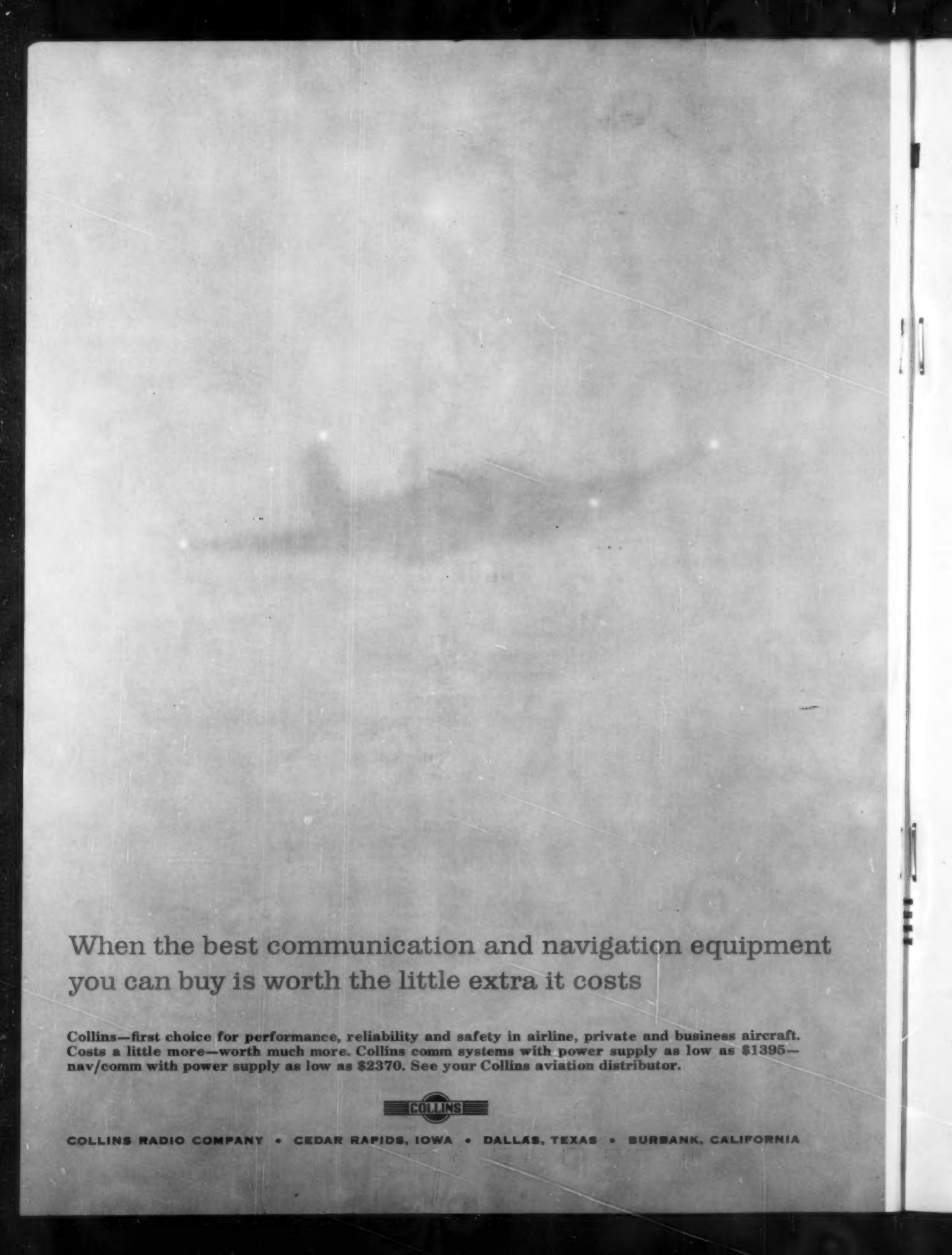
A fisherman's paradise in
the Canadian lake country.

EMERGENCY PROCEDURE FOR CIVIL JETS

Passenger safety is always
of utmost importance. Here's how it is achieved.

CHECK PILOT REPORT:

Champion Sky-Trac



When the best communication and navigation equipment you can buy is worth the little extra it costs

Collins—first choice for performance, reliability and safety in airline, private and business aircraft. Costs a little more—worth much more. Collins comm systems with power supply as low as $1395—nav/comm with power supply as low as $2370. See your Collins aviation distributor.

COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA

need tires?
wheel and brake service?

GOODYEAR
AVIATION PRODUCTS

Head for the sign of dependability–

NEED NEW TIRES? Take your pick of Goodyear's famous aviation tread designs — ranging from self-cleaning, All-Weather diamond tread to sure-tracking, long-wearing rib treads. Your Goodyear Dealer has them all—in the exact size you need—plus a full stock of tubes.

BRAKE SERVICE? WHEEL SERVICE? See the man who sells Goodyear wheels and brakes, he's the best equipped man in flying service. His complete parts stock and trained mechanics assure you of prompt, skilled attention.

WHATEVER YOU NEED — WHEREVER YOU NEED IT! From the smallest replacement part to a complete overhaul, you'll find Goodyear flying service is where you are, with what you need. Goodyear provides the largest and most complete network of service stops in the nation — an assuring fact for the "flying man." Remember—the Goodyear Aviation Products sign is your assurance of superior service.

All-Weather—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Look to the thousands of Goodyear Aviation Products Dealers for "Supermarket" Selection of Aircraft Parts —and here are the wholesale distributors who supply those dealers—

ALBUQUERQUE, NEW MEXICO
Cutter-Car Flying Service

ALEXANDRIA, VIRGINIA
Van Dusen Aircraft Supplies

ANCHORAGE, ALASKA
Alaskan Aircraft Equipment Supply, Inc.

ATLANTA, GEORGIA
Air Associates

BATON ROUGE, LOUISIANA
Louisiana Aircraft

BIRMINGHAM, ALABAMA
Aeromarine Supply Co.

BOSTON (EAST), MASSACHUSETTS
Van Dusen Aircraft Supplies

BURBANK, CALIFORNIA
Air Parts, Inc.

CHICAGO, ILLINOIS
Air Associates
Van Dusen Aircraft Supplies

DALLAS, TEXAS
Air Associates

DENVER, COLORADO
Denver Airplane Supply

DETROIT, MICHIGAN
General Aircraft Supply Corp.

FAIRBANKS, ALASKA
Fairbanks Aircraft Service

GLENDALE, CALIFORNIA
Air Associates

HELENA, MONTANA
Sky Supply

HONOLULU, T. H.
Andrews Flying Service

HOUSTON, TEXAS
General Aviation Supply Co.

KANSAS CITY, KANSAS
Standard Products, Inc.

MEMPHIS, TENNESSEE
The Don Horn Company

MIAMI, FLORIDA
Air Associates
Van Dusen Aircraft Supplies

MINEOLA, LONG ISLAND, NEW YORK
Standard Aircraft Equipment Co., Inc.

MINNEAPOLIS, MINNESOTA
Van Dusen Aircraft Supplies

OKLAHOMA CITY, OKLAHOMA
General Aviation Supply Co.

PHOENIX, ARIZONA
General Aviation Supply Co

PITTSBURGH, PENNSYLVANIA
National Aviation Supply Co.

PORTLAND, OREGON
Flightcraft, Inc.
A. W. Whitaker

RICHMOND, VIRGINIA
Van Dusen Aircraft Supplies

ST. LOUIS, MISSOURI
General Aviation Supply Co.

SALT LAKE CITY, UTAH
Salt Lake Aircraft Parts

SAN ANTONIO, TEXAS
Western Aero Supply Corp.

SAN FRANCISCO (SOUTH), CALIFORNIA
Air Associates

SEATTLE, WASH.
Washington Aircraft & Transport Corp.

TAMPA, FLORIDA
Aviation Supply Corp.

TETERBORO, NEW JERSEY
Air Associates
Van Dusen Aircraft Supplies

TULSA, OKLAHOMA
Standard Products, Inc.

WICHITA, KANSAS
Standard Products, Inc.

WILMINGTON, DELAWARE
Atlantic Aviation Corp.

WINSTON-SALEM, NORTH CAROLINA
Piedmont Aviation, Inc.

Wherever you fly, there's a Goodyear Sign nearby!

FLYING®

AUGUST, 1959 VOLUME 65, NUMBER 2

CONTENTS

Editorial: Salute to the Ninety-Nines 22

Solo Across the Arctic . . . . . *Charles F. Blair, Jr.* 24

Pilot Survival . . . . . *John V. Neeson* 31

The Airman's World . . . . . *Gill Robb Wilson* 32

Emergency Procedure for Civil Jets . . . . . *Marius Lodeesen* 34

Canada's Fly-in Fishing . . . . . *Woodie Jarvis* 36

The Pro's Nest: Altitudes . . . . . *Eugene F. Timpe* 38

Call Me Pantless . . . . . *Russ Brinkley* 40

Check Pilot Report: The Champion Sky-Trac . . . . *Ted Durosko* 41

Airman's Holiday: Cape Cod . . . . . *Novetah Davenport* 42

Memorial to a Pioneer Hero . . . . . *Joseph Volney* 44

Little Planes—Big Business . . . . . *Paul J. Fournier* 46

Wings for the Army Guard . . . . . *William V. Kennedy* 48

Operation Horselift . . . . . *Jim Larkin* 50

Tips to Tyros Alaska Bound . . . . *Lt. Col. Bob Crawford, USAFR* 51

Have You Seen? 52

The Seagull Dogs It . . . . . *Richard D. Bach* 54

I Learned About Flying From That!, No. 234 . . *Eugene K. Friedman* 56

FLYING FEATURES

Mailbox 6

Briefings 10

Have You Read? 14

Hangar Flying 16

Flying Calendar 19

Overnight Stop, No. 52 78

Picture Credits 97

Advertising Index 97

THE COVER: The 1959 model of the Twin Beech Super 18 photographed by Jim Yarnell over Oklahoma City.

GILL ROBB WILSON
Publisher

ROBERT H. WOOD
Editor

C. L. HAMILTON
Managing Editor

ALEX DAWYDOFF
Assistant Managing Editor

MARJORIE M. GRAY
Associate Editor

NOVETAH DAVENPORT
Associate Editor

A. M. COURTNEY
Editorial Assistant

—

FIL GIULIANO
Art Director

—

ROBERT B. PARKE
Advertising Director

DANIEL C. MINNICK
Eastern Advertising Manager

RICHARD V. MACY
Eastern Advertising Representative

JOHN L. FILSON
Midwestern Advertising Manager

ALBERT MILHADO & CO., LTD.
European Advertising Representative
Offices in London, Antwerp, Dusseldorf

Member of the Audit Bureau of Circulations

Ziff-Davis Publishing Company Editorial and Executive Offices
One Park Avenue, New York 16
Branch Offices: 434 South Wabash Ave., Chicago 5, Ill.
Room 412, 215 West 7th Street, Los Angeles 14, California

ZIFF-DAVIS PUBLISHING COMPANY, One Park Avenue, New York 16, N. Y. William B. Ziff, Chairman of the Board (1946-1953); William Ziff, President; W. Bradford Briggs, Executive Vice President; Michael Michaelson, Vice President and Circulation Director; Hershel B. Sarbin, Vice President; Howard Stoughton, Jr., Treasurer.

CONTRIBUTIONS: Contributions should be mailed to the New York Editorial Office at One Park Avenue, New York 16, N. Y., and must be accompanied by return postage. Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions will be handled with reasonable care; but the magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's and contestant's rights, title and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

SUBSCRIPTION SERVICE: All subscription correspondence should be addressed to Circulation Dept., 434 South Wabash Ave., Chicago 5, Ill. Please allow at least four weeks for change of address. Include your old address as well as new—enclosing, if possible, an address label from a recent issue.

SUBSCRIPTION RATES: One year U. S. and possessions and Canada $5.00; Pan American Countries $5.50; all other foreign countries $6.00.

FLYING is published monthly by the Ziff-Davis Publishing Company, William B. Ziff, Chairman of the Board (1946-1953), at 434 South Wabash Ave., Chicago 5, Ill. Second-class postage paid at Chicago, Ill. Authorized by Post Office Department, Ottawa, Canada, as second-class matter.

Copyright © 1959 by Ziff-Davis Publishing Company. All rights reserved.

NO NEED TO LEAVE FRIENDS BEHIND...

TAKE THEM WITH YOU IN A FAST, MODERN

PIPER *Caribbean*

AMERICA'S LOWEST-COST FOUR-PLACE AIRPLANE

Why not trade your present maintenance-greedy two-passenger airplane for a sleek, new, over 130 mph Piper Caribbean? Here's an airplane you'll go anywhere in with confidence, economy and peace of mind—and, with its roomy four-place cabin *plus* lots of baggage space, you can share your flying fun with friends.

At $8,395 the Caribbean costs little more than new two-place airplanes, yet offers you so much more speed, utility and pleasure. Your Piper dealer is in a trading mood, and easy finance plans are available. See him today, or write for the Caribbean brochure, Dept. G-8.

$8,395 ONLY $2,098 DOWN MONTHLY PAYMENTS AS LOW AS $230

OPERATORS

Here's Your Best Money-Making Airplane!

Operators all over the country are singing the praises of the Caribbean. They like the reliability and rugged, long-operating life of the 150 hp Lycoming engine. For student work it operates nicely at 6 gallons per hour (80 oct.). Tricycle gear... simplified, inter-connected controls... famous forgiving Piper flight safety features, protect their investment. And the four-place feature makes the airplane useful for charter, air taxi, or freight, as well.

The Caribbean on your flight line will be a sure money-maker for you—a versatile, all-around airplane. And it's a known fact that clean, new equipment attracts more business.

Ideal for FLYING CLUBS, too!

PIPER AIRCRAFT CORPORATION, LOCK HAVEN, PA.

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

☐ SAFETY AFTER SOLO. How to fly 10,000 hours, with pleasure. John Hoyt. $4.75

Other timely Zweng Manuals for all flight and ground ratings:

☐ RULES OF THE AIR. Revised 3rd edition. Up-to-date regulations. $2.00

☐ PRIVATE & COMMERCIAL PILOT RATINGS. Both ratings in one timely book. With new cross-country written examinations, maps. $4.00

☐ INSTRUMENT RATING. Up-to-date text, illustrated, and new cross-country exams. $5.00

☐ AIRLINE TRANSPORT PILOT RATING. Used by the airlines in their own pilot-training courses. Revised 9th edition. $5.50

☐ AIRCRAFT & ENGINE MECHANICS' RATINGS. Both ratings in one book. With new inspection authorization plan. 19th ed. $5.00

☐ FLIGHT ENGINEERS MANUAL. If you have an A. & E. rating this book will prepare you now for the Engineer rating. $5.00

☐ FLYING THE OMNIRANGE. Shows you how simple omni flying can be. With typical omni flight and test questions. Illus. $4.00

☐ MANUAL OF THE E-6B COMPUTER. Over 400 problems solved and explained. $3.00

☐ HELICOPTER PILOT RATINGS. 1958 edition with revised text and new cross-country written examinations. Only guide available. $5.00

☐ THE AMERICAN FLIGHT NAVIGATOR. Shows you step-by-step how to earn the rating. All work charts, references included. $6.50

●●●●●●●●●●●●●●●●●●●●●●●●●

Check the manuals you want, fill in the blanks below, then clip this ad and send it to:

PAN AMERICAN NAVIGATION SERVICE
12021 Ventura Blvd., F-8
North Hollywood, Calif.

☐ Payment enclosed ☐ Send C.O.D. (In Calif., add 4% sales tax.)

☐ Send me a free copy of your new 1959 catalogue.

Name_____

Address_____

City & State_____

MAILBOX

AVIATION ASSOCIATIONS

The listing of our organization in the Directory issue of FLYING (April '59) resulted in a number of inquiries within a very short time. . . . This was the first time that mention has been made in a publication with an extensive circulation and it is obvious that FLYING is, indeed, widely read.

This issue contained an unusual amount of very useful information and the section listing the Aviation Organizations was of particular interest. . . . On behalf of the officers of our organization I wish to express our appreciation. . . . If possible, could you list our P.O. Box as No. 45834 in a future issue?

WILLIAM A. RILEY, Sec'y.
American Aviation Historical Society
Los Angeles 45, Calif.

I want to take this opportunity to express our sincere appreciation for. including the National Aero Club in your special Directory of Aviation Organizations in the April issue. We have received inquiries from FLYING readers from all over the country.

ROBERT CRAWFORD, Exec. V.P.
Ann Arbor, Mich.

AIRMAN'S HOLIDAY

Your article in the June issue "St. Lawrence Seaway" has come at a very good time. Another pilot and I have been talking about this being a good trip to take this summer.

Your report has more or less climaxed our thoughts.

ROBERT B. LAZELLE
Pontiac, Mich.

● *Glad to hear this. The purpose behind the Airman's Holiday series is to alert our readers to various places of interest and to the local facilities which are available to serve their needs.*—ED.

FATAL PASS

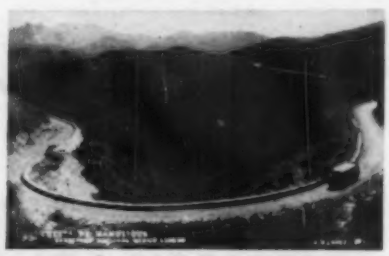
With deep sorrow from all my countrymen we regret the increasing number of fatal airplane accidents (five within a year) occurring to American pilots at Mamulique Pass coming from Laredo, Tex., to Monterrey N. L., Mexico during low ceiling conditions.

To avoid further accidents I would like to give some explanations and opinions.

The WAC chart 522 shows almost a straight highway through Mamulique Pass. Here the Pan American highway is not as straight as it is shown—actually there are several miles of winding road following the contour of the mountain. Some of the curves are very pronounced (see photo) turning back 180 degrees forming U turns at dead end valleys. . . .

The correct flying procedure when the ceiling is low at Mamulique Pass is to go around the mountain towards the southeast. As soon as a pilot checks the town, Sabinas Hildago, he should fly a course of 120 degrees for 45 miles to the town of Cerralvo. At Cerralvo is the paved road from Falcon Dam to Monterrey (NE to SW). This highway can be followed into Monterrey.

If this section also has low ceiling, a pilot can continue on a course 170 degrees for 30 miles. This takes him to the town of Ramones where he circles the mountain's end, following the Reynosa-Monterrey railroad. After flying over Ra-



mones, follow a course of 200 degrees for ten miles till reaching the "on course" signal of the SE leg of Monterrey range, then following the heading of 295 degrees, into Monterrey Airport. By following the "on course" signal, or Reynosa-Monterrey highway, a perfect detour can be accomplished over a low terrain avoiding the mountain area.

Another word of caution: no plane should be flown into Mexico without a radio.

ALEJANDRO GUAJARDO
Monterrey N.L. Mexico

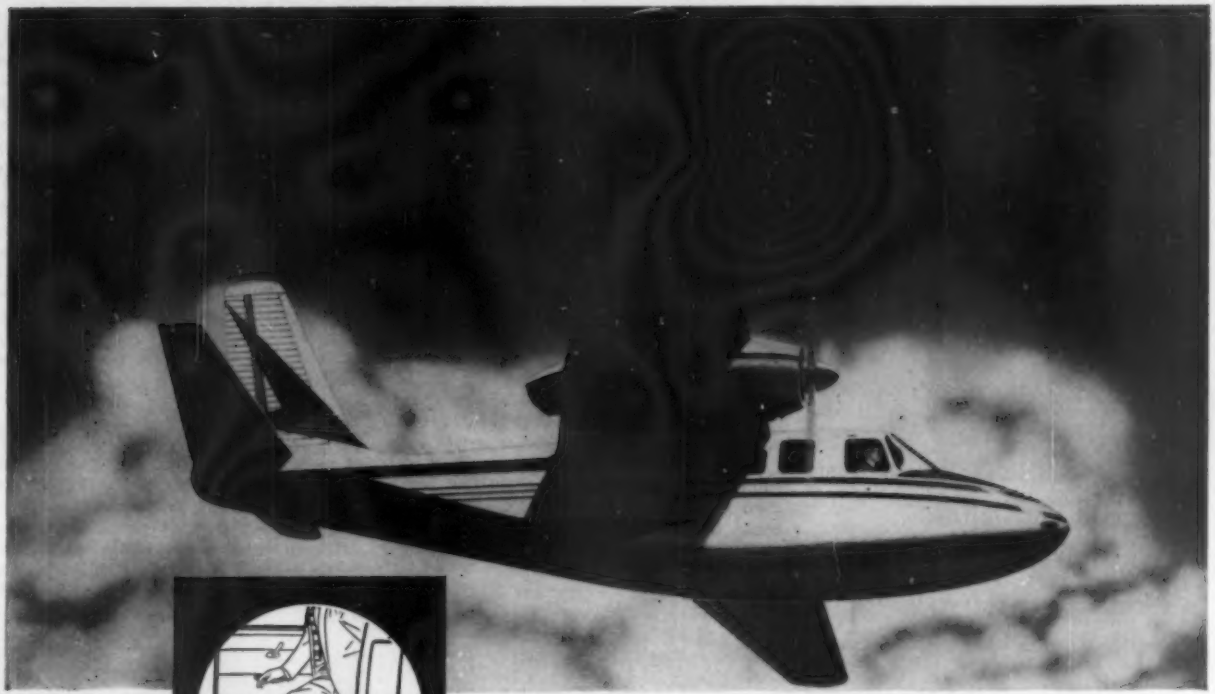
● *We gladly submit Mr. Guajardo's thoughtful and helpful suggestions in the interest of safer private flying below the border.*—ED.

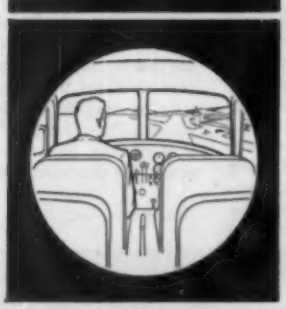
AIR STRIPS AT CAMP SITES

I have noted a recent letter (by Lydia L. Jensen) in June "Mailbox" inquiring about camp grounds near to airstrips.

I would like to answer in part by giving information on such facilities in the Keweenaw, or the Copper Country of the Upper Peninsula of Michigan. The Houghton Sands Airport and Seaplane Base (Lake Superior sectional chart) is situated in the midst of many camping areas. Located a mile from the village, it furnishes free tie-downs and has a full time A & E mechanic. Isle Royal National Park, Porcupine Mts. State Park, Fort Wilkins State Park and others can be reached on an average of 30 minutes flight by float-plane from Houghton Sands

(Continued on page 8)





Aero Commander means business

Any way you look at it, here is Leadership!

To you, Aero Commander leadership means going farther, faster and more easily. It means superior performance and dependability.

Aero Commander's high wing design is a factor of leadership: greater stability, more comfort. It means, too, that you step into this airplane as easily as you enter your car! You lift luggage just knee-high into the ample compartment. And there's panoramic visibility from inside the cabin.

Any way you look at it, this aircraft means business! Your distributor will show you more reasons for Aero Commander's leadership. Ask him, today.

AERO COMMANDER

Another product of ROCKWELL-STANDARD Corporation

AERO DESIGN & ENGINEERING CO • BETHANY, OKLAHOMA

FOR PRECISION NAVIGATION...

ALL NEW

DARE DADF-1 ADF System

DESIGNED TO MEET FAA-TSO C41 REQUIREMENTS

LIGHTER WEIGHT—21 pounds complete.

LOWEST COST—For Airline Class of Equipment.

LOWEST CURRENT DRAIN—Only 1.75 amps at 28 VDC.

SMALLER SIZE—Tuner Amplifier fits short ½ ATR rack.

ROTATABLE AZIMUTH INDICATOR— with 5° increments and N-E-W-S cardinal points to meet latest military concepts of readability.

PILOT-ENGINEERED—back-lighted Mil Std remote control with all ADF features for easiest use. Includes tuning meter, loop test position, C W operation.

ENTIRELY NEW— super-sensitive tube and transistor circuitry. Needs no high voltage power supply.

Have you seen these other DARE products?

DTR-360A-1	360 Channel Transceiver
DN-560	Complete Nav-Com System
DAS-1A	Transistorized Speaker-Amplifier
DGS-20	Glide Slope Receiver
DM-3	Marker Beacon Receiver, 3-light

DARE INC.
Troy, Ohio

MAILBOX

(Continued from page 6)

Airport. A motel is within walking distance of the airport. At present charter service if desired is offered by Peninsula Air Service in a 195 Cessna on floats.

DALE HOLBROOK
Houghton Sands Airport,
Houghton, Mich.

. . . In Rangeley Lakes, Maine (pop. 1,500) we have an airport 2,300 feet long about one mile from town. About a mile and a quarter from the airport (a tenth of a mile from town) "The Manor" has just put in a new camping ground for which there is a slight admission fee.

At the airport gas may be obtained from a local doctor who keeps his plane there and there is a telephone so one could call a taxi. If you wish more information on the airport, write to Oscar Riddle, Rangeley Lakes, Maine.

STUART B. HERNDEN
Rangeley Lakes, Maine.

● *This lake area swinging north and east along the Canadian border covers a several hundred-mile tract of mountain vacationland, dotted with crystal clear lakes, ponds and streams. It offers an unexcelled location for a complete vacation for the whole family. The State Forestry Service maintains public camp sites throughout the region. For information, write Rangeley Lakes Region Chamber of Commerce, Rangeley, Maine.*—ED.

NOT RUSSIAN ROULETTE

After waiting over three years I was especially happy to see your article on the sport of parachuting. As a pilot I am always glad to read the best aviation material available—and FLYING is just that. But as a parachutist I have found an acute shortage in authentic and reliable articles on the sport.

Even among pilots and aviation conscious people the sport of parachuting and skydiving is either unheard of entirely or is only some vague vision of a bunch of paratroopers playing Russian Roulette. We are not all paratroopers and none of us is playing Russian Roulette. Please pass the word.

BUD SELLICK, President
Tennessee Parachute Club,
Maryville, Tenn.

BOUQUET BELOW THE BORDER

This past November, together with a friend, I flew a new Super Cub some seven hours over a great deal of Mexico. Having been more or less active in both civil and military flying the past 25 years I have seen a number of airports from terrible to wonderful.

One of the most pleasant surprises was landing at the new Aeropuerto SCOP., some ten miles east of Chihuahua, and taxiing to the Piper Dealer's, Central Aeronautica. The facilities, prices and prompt, courteous and efficient service were comparable to the finest "country club" airport in any country I have visited.

If you are a jaded Airedale with a touch of inferiority complex, I suggest you stop at Chihuahua, but not at the old strip at the northwest edge of town—and still shown on the charts. It has been closed a year or two, and is full of rocks and houses.

REV. JOE S. HOOKER
Bellflower, Calif.

HE WAS THERE

I enjoyed your article on "Requiem for the B-36" in May issue of FLYING. (However) there was a slight error in that the "Magnesium Monster" without its rudder was from the 99th Bombardment Wing H (SAC) instead of the 92nd. The 99th and 92nd were rival wings at Fairchild AFB, Wash.

Maj. Bill Deyerle was awarded the DFC for flying our RB-36 from Denver to Rapid City, S. D. I was also a member of that flight crew.

DONALD V. FELLING
Bellevue, Wash.

PREFERS TEXAS

In the May issue of FLYING we appreciated the mention and picture of our office building in the "Briefings" section, but there is one thing wrong . . . the address is San Angelo, Texas, not California. We have nothing against California except that we like Texas better. The mistake is forgivable, but if you had said Alaska I'm afraid there would have been a doubt as to our forgiveness. Thanks again for the mention.

GAY COPELAND
Ranchero, Inc.,

STATE AIRPORT DIRECTORY

The State of Illinois Department of Aeronautics is to be congratulated on their most excellent and extremely helpful free Airport Directory. (Mentioned in "Briefings" page 106, February issue).

Their use of aerial photographs to replace airport diagrams is outstanding and a marked improvement over any other method.

Can someone tell me if any other state offers an Airport Directory of any sort?

U. OWEN WALKER
433 Angelus St.
Memphis 12, Tenn.

The man:

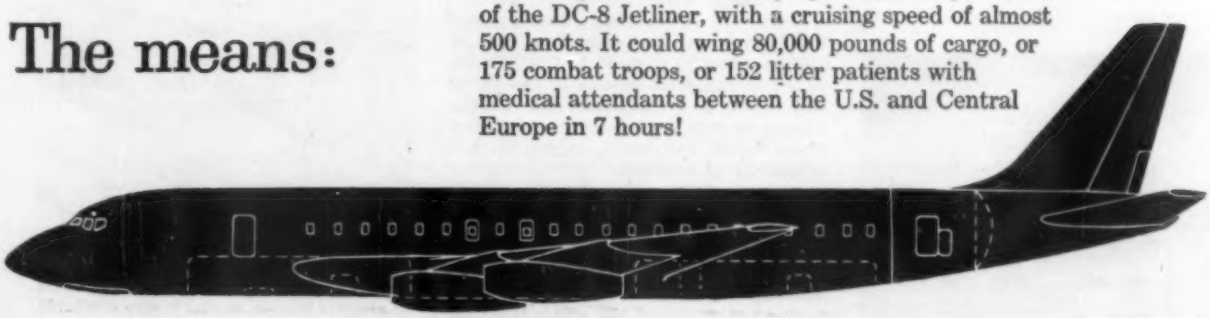
A member of an Army Medical Corps air evacuation team. He belongs to one of the Army units which rush the sick and wounded to general hospitals by air. Fast evacuation of casualties to hospitals has dramatically reduced the number of fatalities in "brush fire" or general warfare.

The mission:

In addition to its priority mission of supporting the strategic striking forces, Military Air Transport Service also has the humanitarian mission of air evacuation—high-speed movement of wounded from base hospitals in the theatre of operations to the finest stateside medical care.

The means:

The Douglas "Jetmaster," proposed military version of the DC-8 Jetliner, with a cruising speed of almost 500 knots. It could wing 80,000 pounds of cargo, or 175 combat troops, or 152 litter patients with medical attendants between the U.S. and Central Europe in 7 hours!

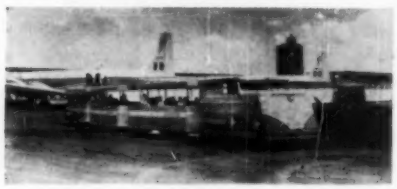


Depend on **DOUGLAS**

The Nation's Partner in Defense

Briefings . . .

VISITORS TO N. Y. INTERNATIONAL (Idlewild) Airport may now take a look at the "behind the scenes" activities of the $150 million terminal city by means of a "Fliteseer." This is a sight-seeing "train" service, which will make 20-minute trips



at 15-minute intervals, following a route along airplane loading aprons, and taxiways adjacent to the individual passenger terminals. In service daily, "Fliteseer" service is 50 cents for adults; 25 cents for children.

BUSINESS FLYING in Canada has increased to the extent that an organization to represent its interests was timely. Hence, the formation of the Canadian Business Aircraft Operators, with John R. Martin of Toronto, Ont., chief pilot for Canadian Breweries, Ltd. as chairman. Although its operation will be entirely separate, this new organization is a division of the Canadian (Aircraft) Owners and Pilots Assoc., headquartered at Ottawa.

CROSS-WIND SAFETY GEAR for a tricycle-geared aircraft has received FAA approval. Manufactured by Geiss Gears, Inc., 3350 Tennyson St., N.W., Washington, D. C., this new development is certificated for use on the Cessna 172s and 175s. Retail price per set is quoted at $240.

UNIQUE ANTI-COLLISION MIRROR which offers a panoramic view about the cockpit, to the sides, above and behind, is a new offering of Aero Developments,

Box 165, Quincy, Ill. Made of chrome, it is both unbreakable and non-magnetic; is mounted by suction cup inside on the lower portion of the windshield. Sells for $9.95.

FOR ITS BUSINESS AVIATION use exclusively, National Distillers and Chemical Corp. is jointly underwriting the construction of a $500,000 hangar at Teterboro Airport, N. J. Property consisting of six acres is on 20-year lease from the Port of New York Authority.

LIFE INSURANCE for pilots, without waiver clauses for any flying, and without additional charges for this additional protection, is available from Mutual Life Insurance Co.'s new Aviation Division, at its branch office 1113 N. 9th St., Stroudsburg, Pa. Up to $10,000 insurance may be obtained by pilots holding valid medical certificates. Underway also is plan for group insurance protection, including aviation accident coverage for clubs.

WEARY BUT TRIUMPHANT, Max Conrad, on June 4, stepped out of his single-engine Piper Comanche at Los Angeles Int'l Airport, Calif., ending a record-breaking solo flight of 7,683 miles from Casablanca, Morocco. His aircraft and

trusty 250-hp Lycoming engine had carried him to a new world's distance record for lightplanes, far exceeding that of 6,979 miles set by Capt. M. L. (Pat) Boling in a Bonanza from Manila to Oregon in 1957. Max, a grandfather and veteran pilot, is no stranger to long distance, over-ocean flights, but this flight was his first official try at a record.

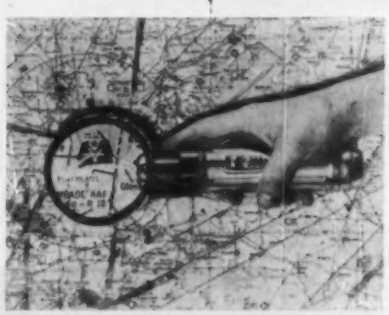
READY TO GO INTO PRODUCTION, Oakland Airmotive, Oakland Int'l. Airport, Calif., is in process of setting up distributorship network for its Super V twin-engine conversion of the Beech Bonanza, pending FAA certification. Four planes are now in production. Powered by two 170-hp Lycoming 0-340 fuel injection engines, the airplane will cruise at 206 mph at 75 per cent of power. Simmonds Aerocessories, Tarrytown, N. Y. developed the fuel injection system. Dave Peterson of Tulsa, Okla., now consultant with Airmotive originated the Super V design.

ON HIS 25TH ANNIVERSARY with Cessna Aircraft, Dwane L. Wallace, president, was honored not only by his company but by 400 Wichita community and aircraft leaders for twofold service to his company and to his community. At a luncheon given by the city Chamber of

Commerce, a gold plaque was presented. Among those paying tribute were (l to r) Brig. Gen. K. O. Sanborn, Comdr. McConnell AFB; Mrs. O. A. Beech, president of Beech Aircraft; Wallace, Mrs. Wallace and N. E. Showalter, Gen. Mgr., Boeing Airplane Co., Wichita Division.

SUCCESSFUL BIDDER on a new low-cost, relatively lightweight DME unit (Distant Measuring Equipment) developed for executive and personal aircraft, National Aeronautical Corp. (NARCO), Ft. Washington, Pa., has received a contract for $273,000 for engineering development work. Delivery of 20 units is promised FAA by September 1960. New DME will permit full utilization of VORTAC navigation system by light aircraft.

PORTABLE ELECTRIC chart reader, especially designed for accurate illuminated examination of charts, maps and blueprints, is a new product of E. W. Pike & Co., 577 Pennsylvania Ave., Elizabeth, N. J. Battery-powered, the magnifying glass gives a 3½ in. field of vision. A spe-



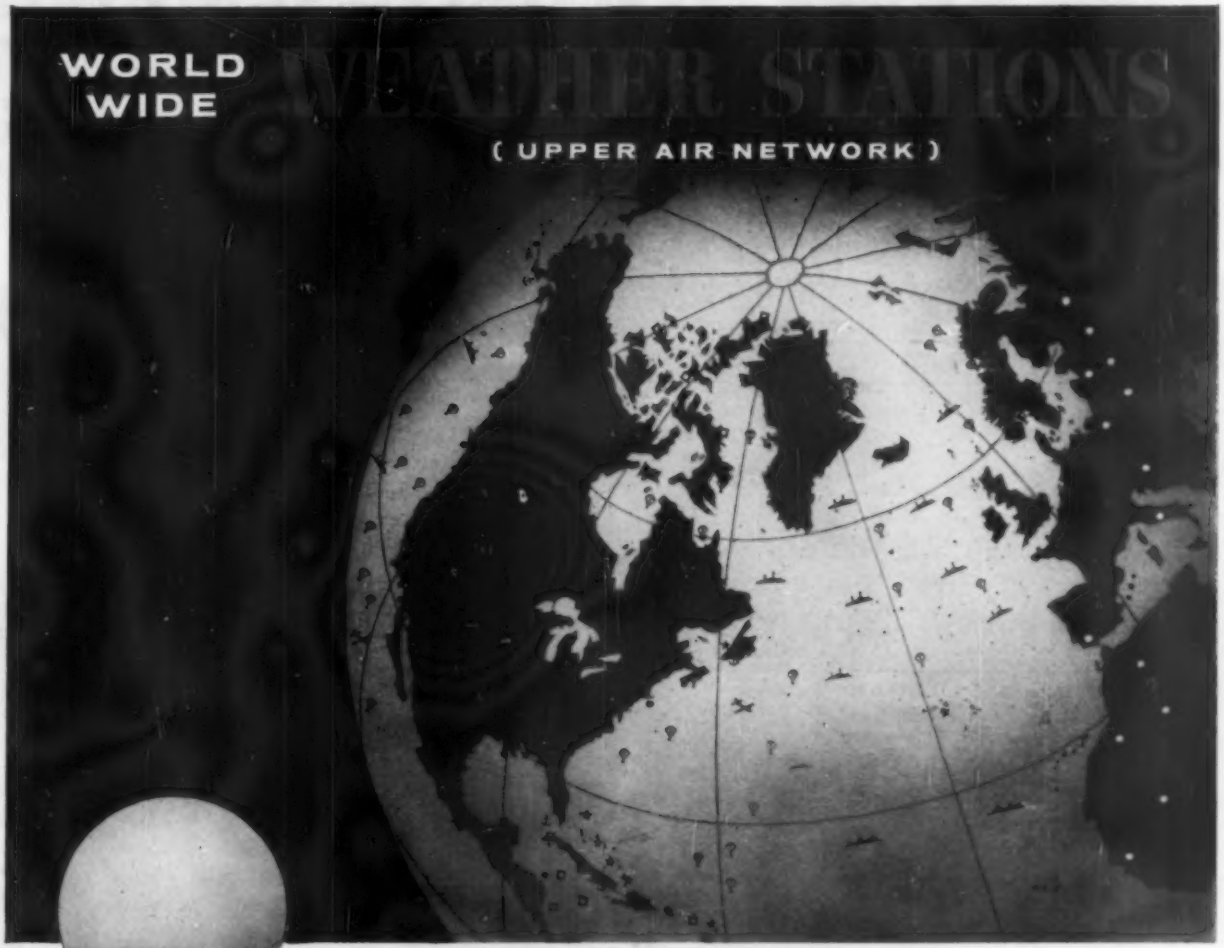
cial bulb for night reading is also furnished. For use where power is at hand, an electric plug-in model is also available. Illustrated literature is obtainable from the manufacturer.

SO SUCCESSFUL has been Piper Aircraft's "Learn to Fly" on vacation program in its initial experiments that the company has announced plans to go ahead with the program on a nation-wide basis. Intro-

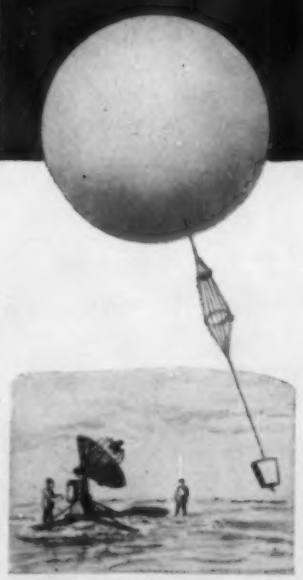
(Continued on page 94)

FLY WEATHER-WISE

These weather items prepared in consultation with the United States Weather Bureau



Upper Air Weather Stations dot the world. Observer technicians in all nations report upper air soundings in accordance with international standards and recommended practices.



Each upper air sounding requires carefully calibrated instruments. Large balloons carry Radiosondes up 50,000 feet to 100,000 feet. Radio signals send back information on temperature, humidity, pressure and, in many cases, on wind direction and velocity.

OPERATING in accordance with plans developed by the World Meteorological Organization (WMO) and the International Civil Aviation Organization (ICAO), a vast network of weather stations, generally about 300 miles apart, takes upper air measurements 2 to 4 times daily. Through international cooperation, the results of these measurements are exchanged on a world-wide basis and are made available to the aviation field and the general public.

Upper air soundings are made with balloons carrying RADIOSONDES which report temperature pressure and humidity at various levels. When available, special equipment also permits measurement of the upper winds at the same time. This combination of information allows meteorologists to analyze the complex structure of jet streams, fronts, tropopause surfaces, etc.

Mobil facilities are another world-wide service available to flyers. You'll find Mobil fuels, lubricants and service are established at key airports in the U.S.A. and overseas. Fly weather-wise. Fly *Mobil!* You're always miles ahead!

You're Miles Ahead with **Mobil**

CHAMPION SPARK PLUG

A new foul-resistant full power at takeoff,

You check magnetos – and the RPM's are "right up there" with new Champion Foul-Resistant Spark Plugs! You give it the throttle . . . and you're off *right on schedule!* Fewer bothersome delays from prolonged burn-out procedure or unscheduled plug removals – despite long flight-time on those plugs! In the air, your engine purrs smoothly all the way – even on extended cross-country hops where fouling deposits could build up on other plugs. Try these new Champions – see for yourself!

COMPANY ANNOUNCES . . .

spark plug—for smooth climb-out and cruise!

New firing-end design provides greater "self-cleaning" action— a major advance in spark plug engineering!

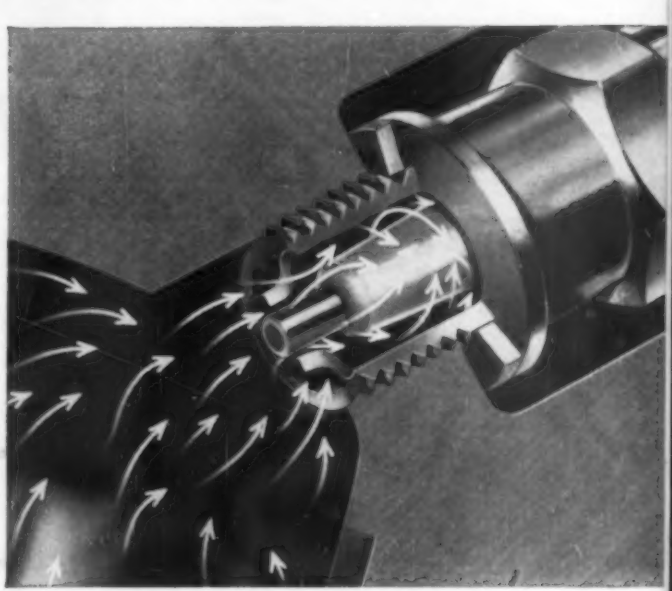
The new Champion *foul-resistant spark plug* has already been CAA-approved for use in Lycoming and Continental engines. It has also been thoroughly field-tested by aircraft operators, who report far less plug fouling than with other plug types.

This is because of Champion's completely new firing-end design. A two-pronged electrode plus a larger bore allows greater entry of turbulent combustion gases. These gases clean away many of the deposits that ordinarily form on the core nose. And the core nose is longer, to give even greater exposure to the cleansing gases. This means:

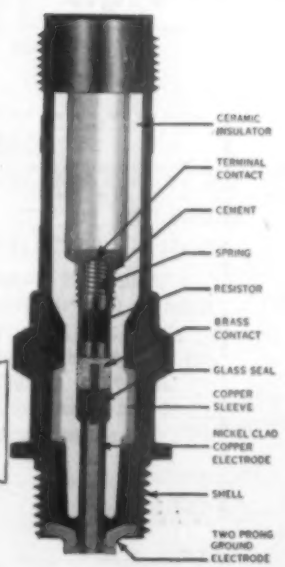
- Greatly improved fouling protection regardless of severity of operating conditions – from idle through takeoff to prolonged flight. (One operator, who normally got only 20 hours on plugs between cleanings, reported 100 hours with these new *foul-resistant* Champions.)
- Fewer unscheduled spark plug removals: More assurance that when your schedule says "go" – you *go!* And you're there on time. (Little danger of being grounded elsewhere to clean or switch plugs.)
- Virtually eliminates burn-out . . . you'll notice much less RPM drop when pulling your magneto check!
- Engines *remain* smooth—even on prolonged flights where fouling deposits could build up on other spark plugs.

For *peak* performance from *your* engine – smooth, continuous full-firing power and dependability at takeoff or in flight – try Champion's new *foul-resistant* spark plugs!

Approved for Continental and Lycoming engines, available in All-Weather RHM 38E and RHM 40E for ⅞-20 installations, as well as REM 38E and REM 40E for ⅞-24 harness.



Longer core nose is exposed to full blast of turbulent, cleansing combustion gases, providing greater protection from fouling-deposit build-up regardless of operating conditions. (Longer core nose also provides longer path to ground to reduce chances of shorting.)



Notice how Champion's new two-pronged electrode design (right, below) provides a larger bore opening, allowing entry of a far greater volume of turbulent, cleansing combustion gases.

CHAMPION

SPARK PLUGS

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

"Just like a telephone..."

TRIED AND PROVEN

The TR-102A is tried and proven. It is **type accepted by the FCC.** More than 2,000 are giving completely reliable service in every type of aircraft all over the world.

LOW COST

Every pilot can afford the TR-102A VHF Communications System at the low price of $229. Budget terms are available as a convenience to pilots who prefer to purchase on low monthly terms. As little as $45 down delivers with up to 18 months to pay.

A PRECISION INSTRUMENT . . . 23 channel VHF transmitter . . . long range VHF receiver tunes 102 to 128 MC . . . compact and light weight . . . performs satisfactorily in planes without shielded ignition . . . generator not necessary . . . operates in fabric planes. COMES COMPLETE with power supply, VHF whip antenna, 2 crystals (122.5 Tower & 121.5 Emergency). Additional crystals factory installed and adjusted, $10 each.

DON'T FLY WITHOUT RADIO

Increase your flying safety. With the TR-102A you can radio 60 to 100 miles ahead for the weather at your destination. **With VHF an EMERGENCY call brings immediate help.**

VHF Radio is rapidly becoming mandatory at airports all over the country. Don't be grounded for lack of VHF communications. **Make use of all radio facilities set up by the government for the private pilot.**

TR-102A INCREASES FLYING PLEASURE

Talk plane-to-plane with other pilots on the private pilots very own frequency.

$229
Budget Terms

TR-102 A

NOVA-TECH OMNI ATTACHMENT FOR PINPOINT NAVIGATION SOON AVAILABLE.

HEAR AIRCRAFT

Hear planes in flight, Control Towers, Weather Broadcasts. Has Standard Broadcast Band also. Enjoyment for the entire family. Brings in pilots' messages, emergency broadcasts, Tower and Ground Control. Follow giant airliners as they criss-cross the skies. Learn important VHF procedure! Has built-in antennas, heavy duty speaker, headset jacks, plugs into any wall socket.

200 mile reception. A must for keeping informed on weather and local traffic. Flying businessmen check on arrivals and departures. Pilot's family can hear him check in on schedule. Tunes 108 to 130 MC

AIR-O-EAR is used by . . . American Airlines, KLM, Transoceanic Airlines, Northwest Airlines, Standard Oil Co., Flying Tigers, Etc.

Model 711 WN

2 BAND	3 BAND
VHF + AM	VHF + AM + LF (200-400KC)
Model 711	Model 711 WN
$79.95	$99.95

ORDER TODAY FROM YOUR NEAREST DEALER OR FACTORY DIRECT!

IRON-CLAD MONEY BACK GUARANTEE

If you are not completely delighted with your TR-102A or your AIR-O-EAR VHF receiver . . . if you are not entirely satisfied for any reason, return it to the factory within 10 days and we will immediately airmail a complete refund.

NOVA-TECH, INC., 1721 Sepulveda Blvd., Manhattan Beach, Calif.

PLEASE SHIP THE FOLLOWING ITEMS WITH 10 DAY RETURN PRIVILEGE: (Aug. Flying)

☐ **TR-102 A VHF Communications system at.....$229**

Install the following crystals at $10 each:

☐ FAA Radio 122.1, ☐ Tower 122.6, ☐ Ground Control 121.7, ☐ Ground Control 121.9, ☐ FAA Radio 122.3, ☐ Tower 122.7, ☐ UNICOM 122.8, ☐ UNICOM 123.0, ☐ 12 Volt Operation, ☐ 6 Volt.

☐ I enclose full payment $_____, ☐ Send C.O.D.

☐ **MODEL 711 WN VHF Home Receiver at $99.95**

☐ **MODEL 711 VHF Home Receiver at $79.95**

☐ **Budget Terms. I enclose $45.**

NAME_____

ADDRESS_____

CITY, STATE_____

HAVE YOU READ?

BY JAMES F. SUNDERMAN

THE SAGA OF PAPPY GUNN, by Gen. George C. Kenney, USAF (Ret.) (Duell, Sloan and Pearce, $3).

General Kenney, wartime Commander of the Far East Air Forces in the Pacific chronicles the life story of Lt. Col. Paul Irvin "Pappy" Gunn, courageous, hell for leather airman-of-fortune who served under him.

Pappy Gunn was one of those few rare types who emerge from every war. His legend hung heavy throughout the Pacific wherever airmen gathered. And like all legends, Gunn's grew into Bunyan-like heroics, perpetuated in no small way by Pappy's own extraordinary gift for story-telling.

Pappy started flying as a Navy pilot. He retired, after 20 years, in 1937, and moved to the Philippines to help found and run the Philippine Airline.

When the Japanese invaded in 1941, Pappy was sworn into the Air Force as a Captain, helped air evacuate civil and military personnel and aircraft to Australia, beginning one of the most bizarre war careers in air history.

Knowing the Philippines like the back of his hand, Pappy proved invaluable to American military operations. His flights into obscure and hidden Philippine airstrips linked our intelligence with native guerillas and the Philippine underground. These were among a score of his individual accomplishments, one of the most important being his mechanical genius in mounting the 75 mm cannon in the nose of the B-25 and proving the weapon against Jap shipping and land installations in daring, low-level bombing and strafing operations.

Kenney tells the Gunn story in a matter of fact, rather dryly interesting way. As his special assistant, idea tester, trouble shooter, experimenter and jack-of-all-air-operational-trades, Gunn developed a unique (for a low ranking officer) close friendship with the top boss. This association richly qualifies Kenney to sift the truth out of the Gunn legend and produce a biography that is accurate, if not vividly dramatic and romantic.

THE BIG X, by Hank Searls (Harper, $3.50).

Former test pilot Searls writes an absorbing novel about the determined pioneers of our last frontiers—the aeronautical scientists, the design and construction engineers, and the highly skilled pilots who test sophisticated theory in the lonely laboratory of infinite space.

The Big "X", rocket ship successor of

(Continued on page 92)

Cessna gives you big-airplane power for as little as $14,250

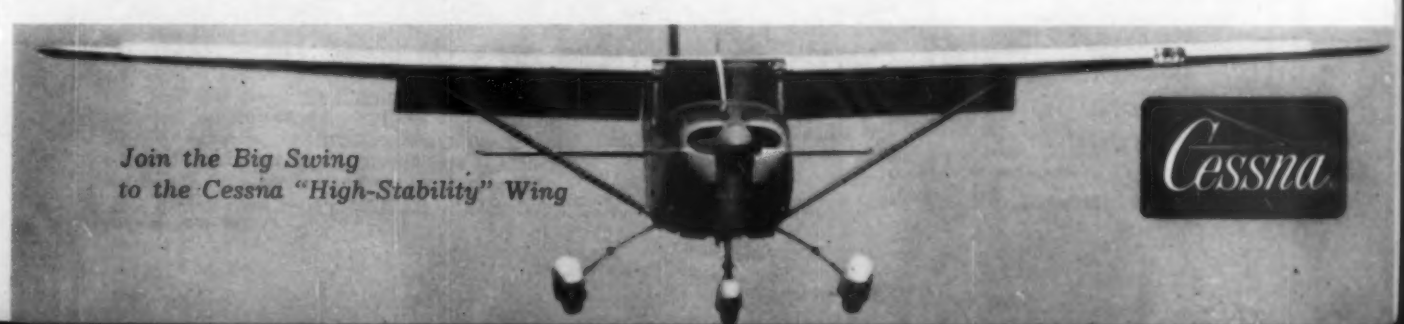
More Skylanes, 182s and 180s (Cessna's magnificent Mighty Middle Line) were sold in 1958 than any other airplane in their class. Reason? Cessna gives you big-airplane power and performance—plus big-airplane size! A power-packed 230-h.p. Continental engine boosts rate of climb to 1,030 ft./min.... elevates service ceiling to 19,800 ft.... broadens range to 667 miles.

The Cessna "High-Stability" Wing's advanced aerodynamic design and extra-large size assure you high-stability performance. For short-field landings, huge 4-position Para-Lift flaps give you complete choice of lift or drag. And for the best in passenger comfort, a luxurious, 4-place cabin (largest in its class) gives you plenty of head-shoulder-leg room.

A spectacular value in the new Mighty Middle Line is the fully equipped, 4-place Skylane (pictured above) with complete radio and navigational gear... wheel speed fairings ... tinted glass in all windows... and many other features "package-priced" to save you money at $17,095 (Cessna 182: $14,600... Cessna 180: $14,250—with std. equip.), f.a.f. Wichita.

In all, Cessna makes *seven* different models—one for every need. You can get a 1959 all-metal Cessna for as low as $6,995 with std. equip., f.a.f. Wichita.

For a demonstration ride, call your Cessna dealer now (see Yellow Pages in phone book). Also ask him about lease plans. Or write: Cessna Aircraft Company, Dept F-10, Wichita, Kansas.



Northrop Institute
airframe & powerplant mechanics graduates
are enjoying remarkably
successful careers
with the following important companies

Airesearch
American Airlines
Western Air Lines
Convair
North American
Pratt & Whitney
Boeing
Kaman
Trans World Airlines
Baldwin-Lima-Hamilton
Lockheed
General Motors
General Electric
United Airlines
and hundreds more . . .

. . . and while these men may start as Airframe & Powerplant Mechanics, many of them now hold such titles as:

Flight Engineer
Service Supervisor
Sales Engineer
Export Manager
Tooling Inspector
and many also operate their own business.

50 WEEKS COURSE—You can complete Northrop's FAA approved training in just one year—and be qualified for immediate employment and a successful career with an unlimited future.

Northrop Institute of Technology
(Northrop Aeronautical Institute)
1119 W. Arbor Vitae Street
Inglewood 1, California

MAIL COUPON FOR COMPLETE INFORMATION

NORTHROP INSTITUTE OF TECHNOLOGY
1119 W. Arbor Vitae Street, Inglewood 1, Calif.

Please send me immediately the Northrop Catalog, employment data, and schedule of class starting dates. I am interested in:

- ☐ Airframe and Powerplant Mechanic
- ☐ Jet Engine Overhaul and Maintenance
- ☐ Aeronautical Engineering Technology
- ☐ Electronic Engineering Technology
- ☐ Aircraft Maintenance Engineering Technology

Name.....Age....
Address.....
City.....Zone... State.....
Veterans: Check here ☐ for Special Veteran Training Information.

HANGAR FLYING

OPERATION PATHFINDER

THE SUN was a brilliant orange on the eastern horizon as we winged our way from Denver toward Chicago on a United Air Lines DC-4 cruising at 7,000 feet. The August night had been clear and beautiful, and the morning was equally so. The weather forecast at Denver had been for clear skies over the route, but now below us wisps of stratus were showing. The stratus thickened rapidly and stretched solidly eastward. The next weather broadcast reported it almost dragging the ground through much of Illinois and eastern Iowa.

Though unexpected, the stratus was no special problem to our Cargoliner flight, of which I was the Captain. Chicago, our terminal, remained open, and our cruising altitude was well on top, in the clear.

Nearing the Mississippi River, we received a radio message from Air Traffic Control: A light airplane, a Cessna 170, had been caught above the fog. With an inexperienced pilot flying, it was lost somewhere near the Quad City Airport at Moline, Ill. Unable to find a hole and running short of fuel, the plight of the Cessna and its two occupants was becoming critical. We were asked to be on the lookout for the plane as we passed over the Moline area.

After receiving the message from ATC, we tuned an omni receiver to Moline. The CAA operator was talking to the Cessna's pilot, trying unsuccessfully to help him determine his position. Though omni-equipped, the pilot was unable to interpret any of the information being conveyed to him by the VOR receiver. Moreover, he was unable to pass on to the CAA operator any information which might have enabled the people on the ground to determine his position. As we listened, the CAA man gave up his efforts to orient the lost aircraft and advised the pilot to turn west in an attempt to find Cedar Rapids, Iowa, 70 miles to the west where the weather was somewhat better—broken clouds at 800 feet compared with Moline's 300 feet and ¾ mile visibility.

And then we saw it! Several thousand feet below, gleaming silver in the early sun and turning aimlessly, was the Cessna 170. Supposedly westbound, he was turning northward as we saw him. Fortunately, we had no passengers aboard with whom to be concerned. We peeled off and dove down for a closer look. No doubt about it, this was the lost plane. We called Moline Radio and advised the CAA operator, while making a 360-degree turn to lose speed and return to the Cessna's side.

Through the Moline operator, we instructed the pilot to join up with us in formation for a direct steer to Cedar Rapids. The only formation he would fly, however, was on our tail, completely hidden from us! We asked his airspeed and were told "125." But at that speed we pulled away; then we remembered: our airspeed was in knots, his in miles-per-hour. At 125 knots we were actually traveling almost 145 miles-per-hour. Gradually we reduced speed and put down 30-degrees flaps. Finally, about 95 knots—just above our DC-4's stall speed—the Cessna was able to keep up.

During this time we had established two-way radio contact direct with the Cessna and checked with the pilot every minute or so, since we were unable to see him on our tail.

Then our lost pilot began having radio transmitter trouble. The transmitter was cutting out, and only his first syllable would come through. We solved that, however, by asking questions which could be answered in one word—usually Roger. We heard the "Rog—" before the transmitter cut out.

At 95 knots it's a long way from Moline to Cedar Rapids, but at last we made it. Again luck was with us. The ceiling was broken, as reported, and one small break was directly over the runway's end. We gave the Cessna pilot the word and down he dived to a safe landing with only a few minutes of fuel remaining.

We circled a moment on top of the clouds, then turned eastward for a slightly belated arrival at Chicago.

DALE E. CAVANAGH
Captain, United Air Lines
Denver, Colo.

DANGER, CHECK RIDE

WHEN I FIRST set out to master flying, the older and bolder told me I would soon fly automatically, making decisions subconsciously and correcting by reaction. I was smart enough then to see the danger of such inattention, but as I too became old and bold I forgot my youthful caution until the day a reflex action took me to the brink of disaster.

I had written a check pilot article on the Aeronca L-16 and being regarded by my C.O. as an authority on the aircraft was selected to check out the other pilots of my CAP squadron in its operation.

First to take the ride was a young lieutenant with 500 hours in his book, most of which had been logged in T-crafts, Cessnas, and other side-by-side planes. Though I had never flown with him, I thought him a competent pilot and was sure he would have no trouble with the L-16.

We climbed away from the field, did stalls and turns for 20 minutes, then entered the pattern and prepared to land. The lieutenant held the plane on base leg until we were opposite the end of the

(Continued on page 91)

New World Record

Sparked by AC at World Congress of Flight

At the controls of her twin-engine Aero Commander 680E, aviatrix Jerrie Cobb swept over an official course at an average speed of 226.148 mph—a new record for class C-1.d aircraft. Starting from Las Vegas, she flew a 1,242.7 mile triangular course over part of California and back to Las Vegas in 5 hours, 29 minutes, 33.9 seconds.

First-class performance in a prolonged high-speed flight requires aircraft reliability of the highest order. That's why Miss Cobb specifies AC Aircraft Spark Plugs for her engines. Says Miss Cobb, "In this kind of activity, engines must deliver peak performance under the most grueling circumstances, from beginning of the flight to the end. So whenever I'm trying to break a record—or for my day-to-day flying—I naturally insist on the most reliable components for my engine, and that includes AC Spark Plugs."

You, too, can rely on AC Spark Plugs for record-breaking performance. You'll find an AC Aircraft Spark Plug—either platinum or massive electrode—especially designed for your engines. Order them from your AC Supplier today.

AC SPARK PLUG ✿ THE ELECTRONICS DIVISION OF GENERAL MOTORS

Aircraft Care starts with

AC

AIRCRAFT SPARK PLUGS

DISTRIBUTED BY:

Airwork Corporation • Pacific Airmotive Corporation
Southwest Airmotive Company • Standard Aero Engine Ltd.
Van Dusen Aircraft Supplies, Inc.

Get transport performance at private plane price

install the powerful LEAR NAVCOM 100

The finest low cost airline type VHF navigation and communication equipment for private and executive aircraft.

Immediate Delivery

COMPLETE "A" PACKAGE

Transmitter, receiver, power unit, shockmount

$1095*

COMPLETE "B" PACKAGE

190 Channel VHF Receiver
90 Channel VHF Transmitter
Power Supply — Modulator — Amplifier
Shockmount, including Connectors
VOR/LOC/Marker Beacon Receiver
VOR/LOC Indicator

$1495*

*28 VOLT $200 ADDITIONAL

ILS ACCESSORIES
Add the new Lear Glideslope receiver including VOR ILS indicator complete for $875.00

LEAR - LEARCAL DIVISION • 3171 South Bundy Drive, Santa Monica, California

THE NEW LEAR NAVCOM 100

Package "A" $1095.00

Includes 5611 Receiver, 5640 Transmitter, 2355 Power Supply – Modulator – Amplifier and Shockmount. Provides ample frequency coverage to operate your aircraft even in high density zones. 90 channel transmitter, 190 channel receiver, both crystal controlled.

Package "B" $1495.00

Adds the 2374 NavPac which provides VOR and localizer signals to the 4080 visual indicator. Also the 2374 provides 75 mc marker beacon signals to phones or speaker and to signal light indicators. Also adds the 4080 indicator which provides rotable omni-bearing selector, to/from indicator, localizer flag and direct reading reciprocal bearings.

ILS Accessories

Utilize all ILS facilities with the addition of the 10 channel, crystal controlled 5607 Glideslope Receiver and 4087 Indicator. This model 4087 indicator can replace the 4080 or be added. It provides glideslope presentation with individual flag alarms for the G/P and LOC. All this for an additional **$795.00** *SHOCK MOUNT EXTRA*

See your Lear Distributor for an eye opening demonstration.

LEAR

LEARCAL DIVISION

3171 So. Bundy Drive • Santa Monica, California

FLYING CALENDAR

Aug. 4, 5—American Astronautical Society 2d annual western regional meeting at Ambassador Hotel, Los Angeles, Calif.

Aug. 6-9—Seventh International Fly-in and convention of the Experimental Aircraft Assn., Greater Rockford Airport, Rockford, Ill. Write: Paul Poberezny, EAA, Hales Corners, Wis.

Aug. 6-9—Sport and Civil Aircraft convention at Greater Rockford Airport, Rockford, Ill., sponsored by Experimental Aircraft Assoc. of America.

Aug. 8-13—Seventh Annual Jaycee Air Cruise Las Vegas-Philadelphia for single and twin engine aircraft. Fee $30. Contact: Bob Carson, Jr. Ch. of Commerce, 121 S. Broad St., Phila. 7, Pa.

Aug. 8-16—International Aviation & Industry Show at The Coliseum, New York, N. Y.

Aug. 9—Watervliet Dawn Patrol at Watervliet Airport, Watervliet, Mich., sponsored by CAP Sq. 639-4.

Aug. 9—Breakfast Flight at Fort Dodge (Iowa) Mun. Airport from 0630 until noon. For details, write: Dodger Flying Club, P. O. Box 465, Fort Dodge, Iowa.

Aug. 10-14 — National Flying Farmers Convention, Fort Collins, Col.

Aug. 15, 16—Grand Western Canadian Owners and Pilots Association Elk Barbecue and Fly-in at Rocky Mountain House, Alberta, Canada. Write N. J. Armstrong, 1603 Center St., N. Calgary, Alberta, Canada.

Aug. 15, 16—Third Annual Maine Air Fair at Auburn (Maine) Mun. Airport, sponsored jointly by Southern Maine Aero Club and Auburn Exchange Club. Economical package deal for weekend at nearby Poland Spring Hotel, incl. cocktail party, dinner-dance and lobster cookout. Military and civilian aviation program includes sky diving, glider demonstrations, etc. Tie-down and float facilities. Write: Maine Air Fair, Auburn, Maine.

Aug. 16—Huckleberry Festival Fly-in at Trout Lake, Wash., south base of Mt. Adams, elevation 1,950 ft. Packed runway 2,000 ft. Whole beef barbecue—prizes galore. Free transportation to huckleberry fields and scenic points; fishing and hunting unexcelled. Contact: R. H. Crothers, Box 915, White Salmon, Wash. Phone: HY 3-2873.

Aug. 16—12th annual Fly-In Breakfast, at Estherville, Iowa. Free breakfast, 0500 to 1000, free prizes, entertainment, sponsored by Estherville Chamber of Commerce.

Aug. 22—Round robin efficiency race sponsored by the St. Louis Aero Club (NAA) from Alton, Ill., Civic Memorial Airport to Arrowhead Airport, St. Louis Cy., Mo. Cash prizes, trophies. Entry fee: $10 and membership in NAA. Rain date: Aug. 29. Contact: Mr. Lackland Bloom, 506 Olive St., St. Louis 1, Mo. Phone: Garfield 1-667.

Aug. 22, 23—Keene (N. H.) Air Show Air performances including jets. Saturday night barbecue, dancing and fireworks displays. Special overnight accommodation rates for fly-in transients. Write: Keene Ch. of Commerce, 95 Main St., Keene, N. H.

Aug. 30—Lincoln Year Air Show, Huntingburg JayCees 5th annual, affiliated with Indiana Lincoln Sesquicentennial. Fly-in Tour and breakfast at Lincoln Park and Santa Claus Land with tremendous Air Show in afternoon at Huntingburg (Ind.) Airport.

Aug. 31-Sept. 2—Annual Army Navy Instrumentation Program (ANIP) symposium and industry briefing at Statler Hilton Hotel, Dallas, Tex.

Sept. 3-6—Air Force Ass'n convention and Panorama, Miami Beach, Fla.

Sept. 5-7—Ninth annual Kentucky Jaycee Air Tour. Free aviation gas. Many of events are sponsored. Write: Kentucky Jaycee Air Tour, 670 South Third, Louisville, Ky.

Sept. 6—Annual Fly-in Breakfast of the Redding Optimist Club at Benton Airport, Redding, Calif. Ham, bacon, eggs: $1.25.

Sept. 6—Second Annual Air Show sponsored by Louisville Jr. Ch. of Commerce, Bowman Field, Louisville, Ky. Huge air show and fly-in. All types static displays and flying demonstrations. Write: John E. Stout, 1010 Republic Bldg., Louisville, Ky.

Sept. 7-13—Society of British Aircraft Constructors, annual flying display and exhibition, Farnborough, England.

Sept. 8-11—Second Annual Flying Physicians Clinical Sessions at Western Hills Lodge, Sequoyah State Park, Wagoner, Okla. Contact: Nat'l Hq., P. O. Box 3275, Tulsa, Okla.

Sept. 12, 13—Fourth annual Fly-in, Big Bear Lake, Calif., sponsored by Big Bear Airport Ass'n. Featuring mountain luau dinner-dance, a fish derby, hole-in-one golf contest, scenic chairlift rides, horseback riding, golfing and fishing. Write: Dan Aberle, Box 411, Big Bear Lake, Calif.

Sept. 12, 13—New York State Flying Farmers meeting at Massena, N. Y.

Sept. 17-20—Second annual "Ruby Rendezvous" and mountain jamboree at Franklin, N. C., sponsored by Fla. Air Pilots Assoc. Contact: Vernon H. Burt, 2471 North West 21st Terr., Miami 42, Fla.

Sept. 23, 24—The 1959 Airwork Symposium at Millville, N. J., conducted by The Airwork Corp.

Sept. 30-Oct. 2—13th annual meeting of the Southeastern Airport Managers' Association at the Washington Duke Hotel, Durham, N. C.

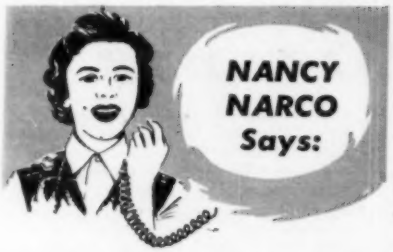
Sept. 30-Oct. 3—Twenty-third annual Convention of the International Northwest Aviation Council at Multanomah Hotel, Portland, Ore.

Oct. 3, 4—Fourth Michigan SMALL RACE from Bay City, Mich., to Benton Harbor, Mich., sponsored by the Michigan Ch. of Ninety-Nines, Inc. Write Elsie E. Ferich, 3106 Yale St., Flint 3, Mich., for details.

Oct. 6-8—National Airports Conference at the Univ. of Okla., Norman, Okla., co-sponsored by the Am. Assoc. of Airport Executives, and the U. of Okla., with active cooperation of the FAA.

Oct. 6-8—12th NBAA Meet, Hotel Leamington, Minneapolis, Minn.

Calendar items must be received at FLYING's editorial offices, 1 Park Avenue, New York 16, N. Y., three months prior to the event.



What About New FCC Rules?

Sure good to see so many of you trying so conscientiously to stay legal in your radio operation. Seems like the job is getting tougher and tougher. Got so bad lately that an FAA Safety Agent asked me to please explain the difference between TSO and Type Acceptance. Let's boil it down.

The Federal Aviation Agency (FAA) governs the air space, the aircraft in it, and the airmen in them.

The Federal Communications Commission (FCC) is an agency which controls the transmission of radio frequency energy, licenses the devices which emit this energy (transmitters), and licenses the operators of such devices. The rule book for the FCC is separate and distinct from the rule book for the FAA.

Now, let's talk about the FCC. Some years ago the radio-active scientists in the FCC found that the transmitters they were licensing were starting to get in each other's hair. Something about too many transmitters trying to use not enough frequencies. Undismayed, they invented some newer, tighter regulations governing the technical characteristics of these transmitters.

The FCC has been busily applying these new regulations to the transmitters they license for television broadcasting, police and mobile radio, industrial communications, marine radio, and all other services including the aviation service. In order to do their job, they had to provide rules to gradually phase out the transmitters which did not meet these new regulations with as little hardship as possible, and phase in the new transmitters meeting the new regulations as rapidly as possible so that the trend toward increasingly cluttered radio frequencies would be reversed before serious interference caused interruption of vital communications services.

So, on and after July 1, 1959, no *new types* of transmitters in the aviation services will be licensed unless they meet Type Acceptance requirements and are so listed by the FCC. But *old types* of transmitters which have previously been acceptable and licensed by the old FCC rules will continue to be licensable until January 1, 1965. After January 1, 1965, no transmitters will be licensed unless they comply with the FCC Type Acceptance requirements, and are so listed.

Narco, and I'm sure other radio manufacturers as well, have managed to go through all this exercise and can tell you which of their transmitters in past or present production meet with FCC regulations. Narco has prepared a thorough and comprehensive bulletin on its product line with this licensability problem in mind, and this bulletin, No. 457, is available for the asking. Write to me, I'll be glad to send you a copy.

Nancy

NARCO • Fort Washington, Pa.

narco SUPERHOMER

Aviation's Most Popular Unit For VHF Communications, VOR Navigation

Pick the Narco Superhomer for maximum radio utility at minimum cost. This compact, single-unit radio gives you crystal-clear VHF reception (108-127 mc), 12-channel VHF transmitter, and VOR Omni-navigation. High volume production plus maximum design simplification make the Superhomer available at hundreds of dollars less than any equipment of similar usefulness and reliability.

Complete unit weighs 11 pounds, measures 4¾" x 6¼" x 10¼", is priced, with 3 crystals, at only **$499.50**

ADD THESE TWO FINE LOW-COST NARCO UNITS TO INCREASE YOUR COMMUNICATIONS FLEXIBILITY

NARCO LFR-3
LOW FREQUENCY RECEIVER

Flat compact unit fits anywhere, gives you LF range and standard broadcast reception. Provision for homing loop. Thousands giving reliable service. Only **$99.00**

NARCO VTA-3
27-CHANNEL TRANSMITTER

Can be installed with own power supply or attached to Omnigator or Simplexer. Includes "whistle-stop" tuning feature. Base price, with 2 crystals, **$135.00**

FREE "How to Fly Omni" Booklet. Send for your copy today.

For more information, see your NARCO dealer or write for brochure.

narco

NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PENNSYLVANIA

MOONEY MARK 20A

Mooney's comfort engineering and quicker ETA'S make any trip a pleasure trip. You travel in comfort and arrive at your destination fresh, relaxed and ready to go. For business or pleasure, flying a Mooney is fun.

Feature for feature, Mooney is the biggest value in today's air-minded world. The Mark 20A is the only plane that will cruise up to 180 m.p.h. *and* operate for as little as 8c a mile.

Now is the time to take a flight comparison ride. Enjoy Mooney's quiet elegance . . . incomparable flight ease . . . space swept design. Mooney features include the quiet, reliable Lycoming engine; retractable landing gear; flying tail; simplified flap system; laminar flow wing; steerable nose wheel; low-wing visability; contour no-sag spring seats; tinted glass windows; retractable foot step; tubular steel frame, and knee-action shock system. The Mark 20A is priced at $14,850 with standard equipment.

Inquire about Mooney's new and unique lease plan. See your Mooney dealer or write:*

***Mooney aircraft, inc.**

Kerrville, Texas

Salute to The Ninety-Nines

GILL ROBB WILSON
Publisher

THIRTY years ago, 1929, the distaff side of American aviation mustered 99 women pilots into an organization of that name—The Ninety-Nines.

Down the roll of the years since then the Ninety-Nines have kept faith on the air frontiers with the spirit and traditions of the pioneer women of America. In ever increasing numbers they have climbed aboard the driver's seat and whipped up the horses toward the future as did their forebears in colonial times and in the day of the Conestoga. We hail them for their cockpit skill and courage--but most of all we hail them for their intelligent understanding of the part they have had to play.

Of the originals a score are gone, several of them in valiant endeavor beyond the call of patriotic service or devotion to their profession. A dozen remain active as pilots. The majority of the charter members have hung up their wings. But the membership of the Ninety-Nines has expanded to some 1,300 and their influence has become a steady light down the middle of the road to every woman who flies or seeks to fly. And not to the women alone but to all the air world.

In the course of the years since the licensing of pilots in the United States began, some 18,000 women have held certificates at one time and another. However, the rate of attrition has always been high and, as of last official report, the number of women active in flying is 7,600 plus, divided in categories as follows: student pilots—4,344; private pilots—2,678; commercial pilots—574. The Ninety-Nines is the one great factor of stabilization in feminine flight activity—the thread of continuity amidst the ups and downs of general aviation.

It was not easy 30 years ago to grasp the concept that the cockpit was a locale of national destiny—a theatre for the continuing creative and imaginative spirit which authored western civilization. Even those of us who so proclaimed it recognized that we had been thrust into a unique vantage point and could not reasonably expect broad acceptance of our testimony. That vantage point had resulted from military experience, a realm devoid of distaff influence in those days. Certainly aviation would have to evolve without the allegiance of the American woman. Certainly she would shun the cockpit.

Yet this proved far from being the case, as the organization and history of the Ninety-Nines has since testified. Membership adamantly demanded pilot experience as a prerequisite. Swiftly feminine pilots saw the same large significance in flight as had the forerunning men pilots. The presence of women at the controls aloft, stunting in airshows, sometimes winning races in open competition, and spanning the continents and oceans in solo projects was a vast leavening in the dour opinion held by the public concerning the ultimate utility of flight.

And it must be remembered that the women did not easily come by their skills in the cockpits. There is always that element of pseudo masculinity that sustains its own ego by isolation of competition it can not face. This the ladies met head-on and overcame with the logic of top-hand performance. In due course the bond of common experience became the criterion of pilot fraternity for men and women alike—and there it stands today. But it was a point that had to be settled if aviation was to be something more than a parade of muscles and myopia. Nor can we forget the part that wives and mothers have played in the morale of the military services or the mental punishment so many women have taken rather than distract their men from careers in civil aviation.

A bit of memory in this connection always brings me a chuckle. Following the first war, after return from overseas, I negotiated for purchase of a flying boat with which I thought to set up a summer barnstorming operation from the wharves of Ohio river towns—Wheeling, Parkersburg, Cincinnati and several others. This looked like a way to pick up some chips.

But it was not to be. One day my father diffidently inquired if my contemplated plans might not be a cruel pressure on my mother's peace of mind. My brother Joe of the Lafayette Flying Corps had been killed and one by one many comrades, whose names had become household words, had been knocked off. Even I was beat up.

Father's remark had merit. I swallowed my flying boat and informed mother of the change in plans. She seemed relieved and I felt my sacrifice was worthwhile.

Then, a year later, who do you suppose turned up as Chairman of the Aviation Committee of the Chamber of Commerce to promote plans for a local airport? You're right—mother!

In a nutshell, such was the comprehensive role of the Ninety-Nines to aviation and to the country. They made the evolution of flight palatable by themselves becoming an integral part of it. It would be the writer's hope that they realize in some measure the length of the shadow they have cast. The American people are in their debt, as is the free world which will remain free only so long as it never turns back from a challenging frontier.

Fly American
the Jet Airline
Coast-to-Coast

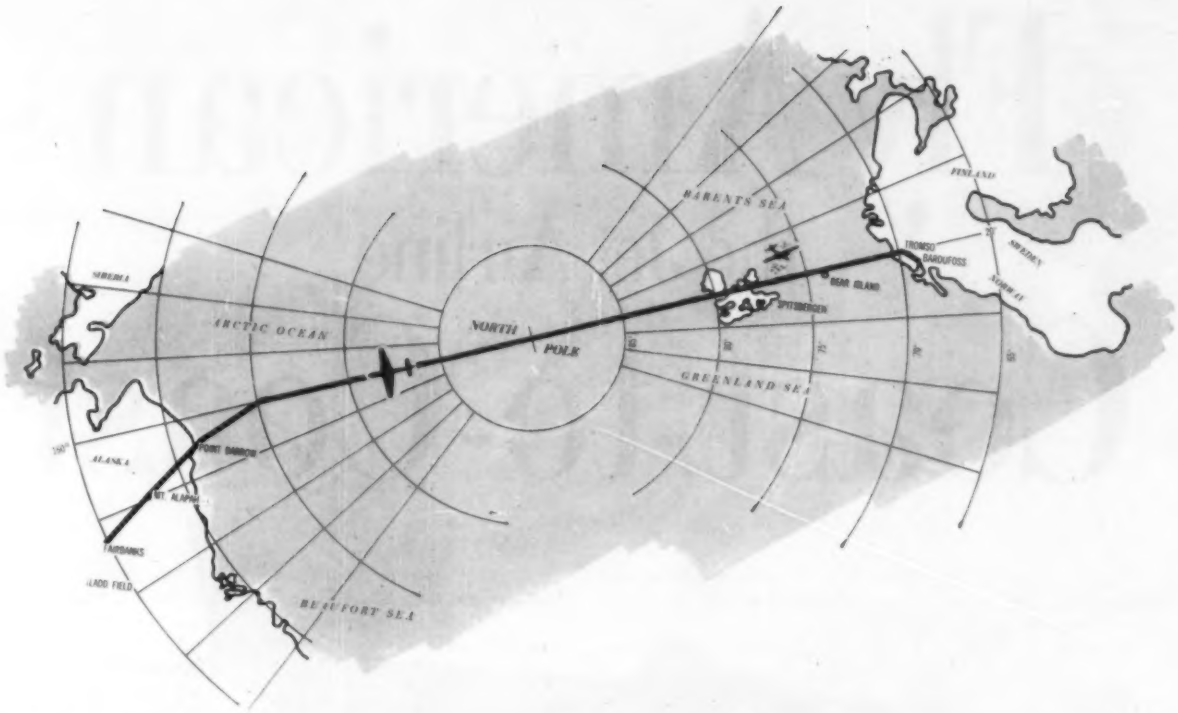
4 JET FLAGSHIPS DAILY BETWEEN NEW YORK AND LOS ANGELES

also daily Jet service from Chicago, Washington, Baltimore, San Francisco, Dallas, Boston

- Now American offers you the most complete transcontinental jet service.
- American's 707 Jet Flagships fly you vibration-free and quiet in the smooth, radar-guided skyways far above most weather.
- On every jet flight, you'll have your choice of deluxe Mercury or economical Royal Coachman accommodations.

AMERICAN AIRLINES
THE JET AIRLINE

For reservations, see your Travel Agent or call your nearest American Airlines ticket office



SOLO ACROSS

THE DAY IS May 29, 1951; the place Bardufoss, a far north fighter outpost of the Norwegian Royal Air Force. I am on the threshold of trying a transpolar flight in a single engine fighter. Because of navigational complexities no one has yet attempted such a solo mission. It is a formidable prospect.

Two hours ago I arrived here from Oslo. In less than an hour more, the F-51 Mustang must be on its way up the 20th east meridian toward the top of the world, and thence to Alaska.

Every move is now geared to the clock. The deadline for departure is 1500 Greenwich Mean Time and it's not a good idea to be late. Because the magnetic compass will be useless in the far north, the tiny ship will be guided only by the sun. When running late, the sun angles measured along the horizon will not precisely fit the flight plan. I have no stomach for a Siberian landfall.

Five minutes of this precious time has been allotted for a chance to rest. Eleven hours have passed since climbing out of bed in Oslo in the early dawn. It will be ten and one-half hours of flight across the Arctic to Fairbanks, Alaska, and another nine and one-half hours across Alaska and Canada to New York. Perhaps it's the thought of the journey ahead that brings on that tired feeling. I sit down in a corner of the Men's Room on the bottom of an upturned bucket and close my eyes for a few minutes. From this humble sanctuary the immediate prospect of flying alone across the top of the world doesn't seem as alluring as it appeared many months ago back home on Long Island. Now the grandiose brainchild has come home to roost and I'm stuck with the disagreeable details.

The take-off will be one of those details. One end of this fighter airstrip at Bardufoss abuts against the end of the fjord, thus dictating take-offs in one direction—down the fjord toward the east. What about that westerly tail wind on the runway? At last reading it was seven knots. Just a few more knots and the one mile of pavement would not be quite enough.

And what about those celestial precomputations? The final corrections were made in Oslo several days ago. From now on, it's blind faith in the numbers against the readings on my timepieces. If a crucial digit was slipped there'll be no landfall on the coast of Alaska. Speaking of landfalls, the forecast for Point Barrow indicates the north coast of Alaska will be weathered in. It might be better to rest and go tomorrow? Tomorrow! Good grief, man! This is procrastination. Tomorrow won't solve this one. Something worse will come up. A surge of irritation jolts me to my feet, jostling the bucket among the mops which clatter to the floor. The sudden outburst has got my blood going again. A glance at the watches on my left wrist confirms that it's time for the briefing.

A cluster of Norwegian officers is waiting in the briefing room. Capt. Helge Anonsen is a stocky, red-haired officer with a huge bushy mustache. He shows a chart of the Spitzbergen area, designated in Norwegian as Svalbard. Captain Anonsen is an expert on Arctic survival. He explains in faultless English. "You will find good emergency landings at these points." He carefully delineates each area with light pencil marks and then goes into considerable detail. There is some question about the Svalbard weather. A cold front is moving in from the west.

The situation will have to be pretty grim to cause a landing on Spitzbergen. Nevertheless it's a good idea to store the information. In case of trouble, that frostbitten

island could suddenly take on the aspect of a Garden of Eden. Captain Anonsen continues to provide a store of welcome detail. Of particular importance, he reveals that the radio beacons on Bear Island and Spitzbergen will be operating continuously until my aircraft has passed the point of no return. He has good news about rescue support. "We have a Catalina flying boat patrolling between Bear Island and Spitzbergen. It departed Tromso three hours ago and is equipped to give you a hand if you're forced down between Bear Island and 80 degrees north. The northern limit of its patrol will be the north coast of Spitzbergen. The radio will stand by on 121.5 for your progress reports. The Catalina's call sign will be 'Blackbird'. Yours will be 'Snow White'."

I feel a warm surge of gratitude for these rugged descendants of the Vikings. They've gone far out of their way to help a stray American, and that goes for every Norwegian who has had any connection with getting this trip underway. Captain Anonsen reveals a little secret of the Norwegian RAF. "You know, Captain," he confides, "We've been trying to get permission to fly our own Catalina to the pole and back. If your flight is successful, we expect to get that permission."

"Then you can expect a tangible expression of my gratitude," I assured him.

A final time check confirms the setting of my three wrist watches. Accurate time is of the essence when flying the Arctic; not only for the sextant, but for steering as well.

The Communications Officer has come in search of the flight plan. We go outside to scribble it off, using the fender of a truck as a desk. The numbers roll easily out of the back of my head. They've been scrambling around inside for weeks. In about two minutes the flight plan has been duly inscribed and is ready for radio transmission to Alaska.

In the midst of this process, Lt. Col. Tvedte returns from the refueling area to escort me to the airplane. He brings good news. The starboard aft section of the cockpit canopy, which tore loose and fell from the aircraft while circling Bardufoss for the landing, has been located by a search party. It's a little flabbergasting to realize that anyone could find such an odd piece of canopy in the wide expanse of drifted snow. It's even more impressive to meet men sufficiently vigorous and frugal to go looking for such a needle in a haystack. I had presumed they would merely rivet a metal plate over the missing section. Now *Excalibur* will be as sleek and shiny as ever.

This Jon Tvedte is an excellent commander, judging by the way things are done at this vital outpost of the northern hinge of NATO. Like many of the men in the Norwegian RAF, he speaks English with hardly an accent. At

THE ARCTIC

Here is the hitherto untold story of the first and only solo flight across the top of the world in a fighter plane.

By CHARLES F. BLAIR, JR.
Captain, PanAm

The author at the start of the flight which won him the Harmon International Trophy in 1952.

The *Excalibur III* at Bardufoss, fighter outpost of the Norwegian RAF.

lunch an hour ago, together with his executive officer and charming Canadian wife, he had framed a familiar question.

"Captain," he inquired with a sympathetic twinkle in the eye. "What's the *real* reason for this journey? I would expect to see some advertisements inscribed on the side of your aircraft."

"It's non-commercial," I assure him as a starter.

There's never a pat answer for this question about motivation. It all depends on who asks. Because Colonel Tvedte's philosophy appears to be not much different than my own, the answer will come easier. Not only that, most Norwegians have a special affection for the far north, which makes this kind of expedition more intriguing for them. Many people could put the same question and go unanswered. Their question is usually a little sly, as if trying to trap a fellow into a confession of insanity. But to Tvedte my explanation is simple. I explain that 20 years of military and airline flying, test work including fighters, running a tramp airline on the side, along with an odd quirk for quick and easy celestial navigation —it all adds up to a pilot being oddly equipped for a job like this, a special job that puts the big squeeze on everything he's ever learned.

"Looks like it's tailormade," concedes the Norwegian.

Now we're on the flight line. The conversation is about over and the performance is scheduled to begin. *Excalibur III*, since arrival from Oslo, has been poised in take-off position on the end of the strip. It is an alert looking machine, in spite of the fact it's glutted with fuel. A gentle trickle of gasoline flows from under the right wing. This is a chronic problem, stemming from the lack of fuel cells in the wing. The airplane wing is simply full of fuel from tip to tip—the outer skin of the wing, plugged here and there with zinc chromate paste, forms the tank. The leakage has been much worse on other occasions and I'm pleased it's now only a trickle. Our total fuel is 865 gallons, all carried internally—enough to take us 1,000 miles beyond Fairbanks.

Because there's more than a half ton of this fuel in a tank behind the pilot's seat the airplane rests heavily on the tailwheel. This tailwheel tire is the Achilles heel of the expedition. That's why a spare has been cluttering the cockpit all the way from Oslo. It will now be left behind.

Lt. Gaarde emerges from under the airplane's tail, detaching himself from a cluster of RNAF mechanics who've been swarming over *Excalibur* since its arrival. The lieutenant, who is engineering officer of Bardufoss' Vampire jet squadron, thoroughly understands his business. He has worked with F-51s before and I'm glad of it. Now he is concerned about the tailwheel strut. Because of corrosion it's not possible to pump up the strut sufficiently to properly support the fuel weight. A good lurch would break the tire.

THERE'S nothing much to be done about this except inspect the runway for rough spots with the idea of steering the smoothest possible take-off course. A trip down the runway in a jeep turns out to be useful in other respects as well, affording opportunity to make a mental note of various runway landmarks for gauging take-off performance. There are other last minute preparations; checking the sextant, stowing the navigation gear, and inspecting the storage of survival equipment contributed by the United States Air Force. There's also a .45-calibre pistol, in case a belligerent walrus should cross our path. My clothing is bulkier than usual. Normal wearing apparel consists of sport jacket, slacks, white shirt and tie, covered by a summer flying suit. As a concession to the Arctic, a hunting jacket and flying boots have been added. If I am forced down, I will be the most fashionable tourist ever to roam the ice pack.

The work is finished and the men have stepped away, leaving the airplane standing alone. *Excalibur* looks beautiful, its deep maroon lacquer glistening in the afternoon sun. A small American flag is emblazoned on the fuselage. Lt. Gaarde battens down the canopy after jamming me into the cockpit. This will be my prison for some ten and one-half hours.

The cockpit was obviously built to house little fellows, and it's my misfortune not to fall in that category. The added array of navigation and survival gear has further shrunk the working quarters to a size allowing only a minimum of movement. With both upper arms jammed against the canopy tracks, it's difficult to turn to right or left, although there's free movement of forearms and hands. If anything falls to the cockpit floor it will be impossible to retrieve it, an extra hazard that has called for a further clutter of precautions. There's always the unhappy possibility of a leg cramp but we'll take that as it comes.

AT the flick of a switch the Rolls Royce Merlin suddenly comes alive, then settles to an even staccato for a minute of warm-up. All the gauges appear to be on the money, and the clock reads 1458. I'll squander those extra two minutes in the fjord on the climbout.

At brake release, the little red airplane starts gathering momentum, riding heavily on its delicate tailwheel but with the airload gradually easing. A short distance down the runway the take-off is committed. There's no stopping this fuel-heavy bird now but one problem disappears as the tailwheel comes free of the ground. The obnoxious tailwind is adding critical footage to the take-off and the airplane is so unstable that extra speed is needed to become safely airborne. With marginal runways, this means keeping the main wheels on the ground until the last few yards of pavement.

The end of the runway is coming up with a rush. There's a dip at the end and a sharp rise. *Excalibur* is launched as if by a catapult, then staggers along a few feet above the floor of the fjord, struggling for a little more speed. Not far from the end of the runway is a knoll. There's no chance to rise above it so we ease around it, slightly to the right. Suddenly the ground drops away in a gentle downslope and it's clear sailing down the fjord. The valley widens and stretches in an easterly direction with towering, snow-covered mountains on both sides.

The 20th east meridian, which is our path to the pole, lies several minutes ahead. At 1506 on the Greenwich clock we'll slip over the rim of the mountains and be on our way. But right now there's a few minutes for a look around. The airplane is wallowing badly but, having gained plenty of speed and altitude, the instability has become only a minor inconvenience. Off to the left a pair of Vampire jets are coming up from astern—my Norwegian friends seeing me off. The weather is cloudless, with unlimited visibility affording a view of breathtaking grandeur as the airplane climbs above the mountains. Over the nose stretching all the way from Tromso to North Cape is a spectacular panorama of the Arctic coast of Norway studded with precipitous snow-clad mountains interlaced by the blue-black waters of numerous valleys and fjords.

Excalibur turns into the 20th meridian and heads due north. My friends in the jets peel off and turn back toward Bardufoss. The coast of Norway recedes and soon a cloud deck intervenes to blot out the ocean. It's like flying into a void, having lost identity with the civilized world. But there's one tie remaining. Off the left wing hangs a glistening ball—the sun.

Charlie Blair pauses in front of Squadron Headquarters at Bardufoss for friendly word with RNAF officer.

The aircraft is still wallowing, although doing better now that the tail fuel is being gradually used up. Shortly it will stop galloping and start flying like a real airplane. Its occupant is also doing reasonably well. Breathing undiluted oxygen during the climb added some extra zest.

After leveling off at 15,000 feet, it occurs to me that I'm needlessly finicky about holding a precise altitude, a fixation probably chargeable to years of airline flying in traffic. In this year, 1951, there is no air traffic in the Arctic. Unless some Russian is frolicking from a base in Franz Josef Land, this is probably my private ocean at least as far as the pole. After the pole there could be an American B-29 reconnoitering the weather. So, although nothing stands in the way of cavorting between altitudes in uninhibited fashion, the long years in the groove have produced a creature of habit. It's neater to stick to the stodgy flight plan. This plan calls for climbing to 22,000 feet after passing Spitzbergen, then up to 25,000 one hour after passing the pole. For the present it's best to hold 15,000. Until north of Spitzbergen a strong northwesterly quartering headwind is forecast for the higher levels. Because there is no cockpit pressurization we'll not climb higher than 25,000 at any time, unless more altitude is needed to maintain sight of the sun.

It's time to set up the sun compass. The only other compass on the airplane is a tiny magnetic one—it's already averaging out a ten-degree error. But what can a fellow expect for ten dollars? It's been a little gem at lower latitudes and has long since paid its way. More elaborate compasses have been thrown out because they couldn't be adapted to peculiarities of the airplane. Now we'll drag out our expensive sun compass. This one cost $12.50, war surplus.

Accommodating this style of compass involves setting up a metal bar across the cockpit in front of my seat. The compass is installed on a mount that travels back and forth along the bar to whichever side of the cockpit is required for sighting. After rummaging around in my cage for a couple of minutes, the new compass is installed on the left end of the bar, ready to go. The sun is over the left wing, slightly aft, and some 20 degrees above the horizon.

It's 1530 GMT now. The calculations call for a relative bearing on the sun of 255 degrees, or 15 degrees abaft the port beam, in seagoing parlance. After setting up the correct numbers on the sun compass, I gently turn the airplane until the shadow of the sun falls between a pair of lubber lines on the sighting bar. That's exactly where we want to steer. There's no error in this gadget.

This business of steering by the sun is quite simple. Considering the speed we're traveling, it's necessary only gradually to steer left toward the sun, lessening the angle between the aircraft nose and the sun by two degrees at the end of each ten-minute interval. Eventually, some two hours after passing the North Pole, the sun will have come around over the nose. By that time the angular change every ten minutes will have increased to three degrees, and thereafter we'll gradually be steering away from our celestial guidepost. Upon reaching Point Barrow, the sun will have progressed well to the right of the aircraft's nose.

Operating the sun compass is an engrossing activity, so much so that the loneliness of the Arctic is forgotten.

We're coming up on Bear Island, a Norwegian pinpoint on the map, spotted close to the 20th meridian. As it passes abeam, the radio direction finder makes a leisurely swing to the left. By timing the swing, our position is

fixed some 20 miles to the east, which is directly astride our chosen meridian. The airplane is tracking due north, angling a few degrees to correct for the drift of the northwesterly wind. There'll be one more radio check going abeam the Svalbard radio station on West Spitzbergen. After that the radio will be shut down.

Spitzbergen, for the past half century, has been a dramatic name in the history of the Arctic: the jumping-off place for many an expedition into the far north. Any Arctic explorer, even the transient aviator who is out for a quick look at the Arctic, would appreciate a chance to see Spitzbergen. But today at 15,000 feet it's not to be. The cloud deck is unbroken. A pilot must be content with the impersonal swing of the radio direction finder.

We're due on the air with a position report for the Norwegian flying boat. This air-sea rescue Catalina, commanded by Lieutenant Johansen, should now be patrolling between Bear Island and Spitzbergen.

"Blackbird from Snow White."

THE first call establishes a tenuous contact. We're still some distance from one another and my receiver barely picks up their transmission. After acknowledging the position report, they inquire if all is well. They are flying below the overcast in the vicinity of Spitzbergen. It's reassuring to know that Lieutenant Johansen and his crewmen are not far away, and that so many officials in the Norwegian government have taken such a fatherly interest in what happens to this odd polar expedition. The Norwegian RAF have treated a foreigner as one of their own. But national boundaries seem to lose significance in the far north. There are no aliens among airmen up here.

The Spitzbergen radio passes abeam at 1716. I go on the air with a final position report, then shut down all radio. Soon afterward *Excalibur* crosses 80 degrees north. The upper winds should be tapering off. We climb to 22,000. The climb at high engine revolutions tends to clean up the sensitive spark plugs. Settling down to cruise at that level, the engine runs as smooth as silk. This engine has a minor quirk, the possibility of accumulating lead deposits on the spark plugs while cruising at low rpms. The cure—every now and then increase power for a few moments to burn out the offending deposits.

Another engine characteristic deserves some consideration. This type is liquid-cooled. A pilot must be wary of any malfunction that would cause the coolant to overheat and boil away. That coolant gauge will come in for its share of attention. But this is a very rugged engine and I have little to worry about from that source. It will develop maximum continuous power as high as 35,000 feet. Flying non-stop on the 3,500 mile leg from New York to London, it was operated at maximum continuous power during the entire trip and thrived on it.

The fuel from the rear tank has been used up and *Excalibur* has ceased to gallop. Because it feeds from only one side at a time, the airplane gradually grows wing-heavy. It's necessary to shift the fuel source from one wing to another at half-hour intervals to keep lateral balance. These details—the continuous routine of adjusting the sun compass, shifting from one fuel tank to another, keeping an eye on all the gauges, occasionally running the engine to high revolutions, operating the sextant and other navigational functions—keep me occupied.

The sun is slightly forward of the wing now. I preset the sextant according to last week's computations and squint through the sextant sunshade. The sun is thus reduced to a tiny green pea. It wobbles around a little but averages out right in the middle of the sextant's bubble horizon. That means we're still on the 20th meridian, dead on track. At 83 degrees north the clouds suddenly break away, revealing a limitless ocean of unbroken ice reaching out beyond the distant horizon. To a traveler in the company of others this might be just another beautiful view. But to a man alone in the Arctic it's almost supernatural. Today it must be especially so. A thin purple haze has softened the stark whiteness of the snow, casting a tinted glow on the rippled surface of the ice-cap. Little puffs of cloud hang motionless. The high altitude tends to soften the panorama. A man on the surface would probably find those ripples rather formidable. A forced landing would be a rough affair.

This brings to mind a conversation with General Riiser-Larsen several days ago in Oslo. More than a quarter of a century ago, he was Amundsen's pilot on an early quest for the Pole by air. Having lived on the surface for many months after being forced down, he wasn't very optimistic about a fighter forced landing. Because of conflicting ocean current the ice on the European side of the pole is generally rough, except in odd places. It's reputedly better on the Alaskan side. If the engine is thinking about failing, it had better wait until we reach that smoother ice. Right now it's running without a trace of roughness. In any such event there is no alternative to riding this machine down to whatever landing the surface affords. It would be futile to bail out and leave behind the survival gear which could not be attached to my parachute. "If you're forced down north of latitude 85, you'll find no living thing," warned Riiser-Larsen, thus recounting his own experience.

The airplane drones on past 85 degrees north. The white spinner on the nose points precisely up the meridian. The haze is deepening, causing a further reddening of the ball of the sun which in turn deepens the spectacular coloration of the ice. We sweep on past 86—87—88—89 north latitude. The little green pea always wobbles in the middle of the bubble when the sextant is pointed at the sun. There's very little wind now, requiring no correction for drift. The sun is gradually getting closer to the nose. It's low in the northwest, some 21 degrees above the horizon. The haze to the north has continued to thicken, reducing visibility to a few miles. I vainly search the northeast sky for the moon. It should be popping up over the horizon. But the moon fails to show. Are we flying in circles? Could there be a defect in the computations?

Steady, fellow. That haze is too thick to see a daylight moon.

The sextant is pre-set for the sun's declination. At 1955, according to the reckoning, *Excalibur* will be crossing the top of the world. At 1955, GMT, the little green pea of the sun wobbles once again in the center of the sextant bubble. Suddenly we are heading due south.

BUT every direction is south. It's like sitting on top of a giant maypole, faced with a pick of countless streamers, one of which leads to Point Barrow. Others lead off to Siberia, to Greenland, or back to Norway. The choice has long since been made. It means holding the sun steady off to the left of the airplane's nose, exactly where it was during the last few minutes before reaching the Pole. This selects the right streamer.

But the whole perspective has changed. A moment ago it was an evening sun in the northwest sky. Now it's a morning sun in the southeast. The airplane didn't flip, nor did the sun. It simply gained 12 hours on the clock. *Excalibur* should be arriving in Fairbanks, Alaska, before it left Norway! This oddity is of interest only to stamp collectors who pay close attention to dates and times of stamp cancellations. Our payload is 3,000 covers of transpolar mail addressed to a charity in New York. There's one other piece of mail aboard; a letter to Santa Claus.

It's for my small boy. Opening the sliding window a crack, I let the airstream whip it away. Following it is a book of matches inscribed by friends from the Savoy in London, my place of abode while in England. If there happens to be an odd tourist down below, he might need a match.

The airplane bores on along the 160th west meridian. As the sky condition changes, the haze is transformed into ice crystals. They fail to blot out the sun but horizontal visibility is reduced to nothing. Looking straight down it's still possible to glimpse the ice, but we go on instruments.

The little ten dollar compass reads 60 degrees which now adds up to 120 degrees of error, but the $12.50 model is doing very well. In spite of the ice-fog, the sun is still casting its vital shadow down the sight bar. Our unerring guidepost is now moving around the horizon at 15 degrees an hour and will soon be speeding up to 18. Two hours from now the sun is scheduled to be directly over the nose. Then it will be high noon on the 160th meridian.

At 85 degrees north on the southward leg, the flight plan dictates a climb to 25,000 feet. I pay close heed to the oxygen equipment as the aircraft levels off at the higher level, still well below the top of the crystalline haze. The oxygen mask is only a minor discomfort, although it fits so tightly it creases the face. A check of the oxygen supply shows it exceeds the fuel endurance, but there's no shortage of fuel. A flick of the switch transfers the reserve oil supply to the engine tank. Fuel, oxygen, oil. Everything checks.

The monotony of being suspended in a white firmament surrounded by a vast emptiness allows the mind to wander. Even the name of the airplane becomes a matter for consideration. The name has been changed since its last visit to Fairbanks. On that preparatory visit last August the name of this ship was *Stormy Petrel*. Today the engine cowling displays *Excalibur III*. On the radio the airplane is called N-1202, a number which decorates the wings and tail.

As a rule I'm not superstitious, but there might be something in a name. A stormy petrel is a small, long range bird of the sea. Therein lay the significance of the original name. But the stormy petrel is also known as a harbinger of ill-fortune. Misfortune did dog the airplane while it bore the name. Every flight from its original base at Burbank produced some mechanical problem that taxed my ingenuity. Some of the difficulties were circumvented by devising odd procedures; others were met head-on by "folding" money, a commodity hard to come by. Quite innocently the airplane became the storm center of a legal controversy. For a few months it was in hiding. Some of the new equipment required too much expensive testing. Being the lone backer of this project, the bad luck was on my back. *Stormy Petrel* wasn't a lucky ship.

Excalibur III has done better. There have been other Excaliburs. The first was a four-engine flying boat, my first transatlantic command. *Excalibur II* was a Curtiss Commando, an aviation tramp. It was my own. These were lucky ships when I flew them, but most of all I haven't forgotten a story about King Arthur. There was magic in his sword *Excalibur*. There's magic in this little airplane.

We're still on instruments in a white bowl. The sun has come around directly over the nose, a perfect set-up for a check of our southward progress. The sextant shows us to be on the 80th parallel within a minute of flight plan. This is the first positive check on speed since passing Spitzbergen. We're holding closer to flight plan than one would dare anticipate. The cockpit heater has been shut down but I am perspiring in the glare of the noonday sun and from the uncontrollable excess of heat pouring back from the engine. The outside air temperature is a cool −40. This would be a good time for a bite to eat, but the idea fails to appeal. It's too much trouble manipulating the oxygen mask for quick bites of a sandwich. Anyhow, it's time to begin thinking of Alaska. The coastline is less than 600 miles away.

Some recollections of Fairbanks come to mind. I wonder idly about the weather and the reception we'll get. My feelings about Fairbanks are colored by odd memories of a visit there last August. It wasn't exactly a hearty welcome. That was a trip to reconnoiter the area and to become familiar with the problems of approaching this Alaskan metropolis from the north, just as we now are.

Ladd Field, the port of entry at Fairbanks, is a military airport with a split personality. It houses some of the civilian airlines. To fly into Ladd, an itinerant pilot must first seek permission via the Pentagon in Washington. Having received this, he notifies Fairbanks via normal CAA communications from his last port of call. This message warns of the estimated time of arrival plus giving routine statistics about the airplane and pilot.

Lt. Col. Jon Tvedte, CO of the fighter outpost at Bardufoss, briefs Blair on runway layout.

All this was duly accomplished and the *Stormy Petrel* arrived over Ladd from Seattle, precisely as advertised. Fortunately, a heavy thunderstorm saturated the area at that particular time. The inhospitable weather turned out to be a protective cloak against a larger misfortune. The departure message from Seattle had misfired somewhere in the chain of communications. If this had been an ordinary airplane, the mistake would have been of minor consequence. But the Korean war was at the height of its fury and everyone was thinking about Pearl Harbor, for good and valid reasons. Now here on another Sunday came an unannounced fighter, deep maroon in color and oddly adorned. The gunners were in position, itching for target practice. The cloudburst served to cheat them.

After I taxied to the ramp, a young Air Force lieutenant, drenched by the rain, came out to investigate the unannounced prowler. Base Operations had received no file relating to such an aircraft. However, after I flashed

a few documents, the lad thawed out and offered congratulations.

"Congratulations for what?" I inquired.

"For not getting shot down," he retorted with a grin.

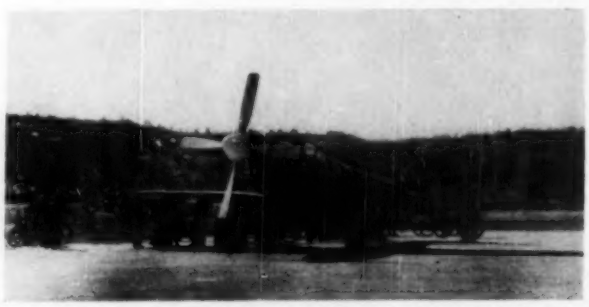
Today in Fairbanks there should be no foul-up. This morning in Oslo the airport was booming with press-agentry. Pan American Airways, whose transatlantic routes are my usual occupation, happens to be no slouch at such matters. News reels were grinding all over the place. A half-dozen messages sent ahead to Fairbanks had spelled out the precise details.

I start tinkering with the radio compass that has been shut down since passing Spitzbergen. While it's warming up I crank in the frequency of Point Barrow radio and turn up the volume, not expecting to hear anything. But with a crash of background noise the radio comes to life. From out of the noise comes the unmistakable signal in Morse code—PBA—PBA—PBA. The wonderful, cock-eyed world is calling us back!

The radio direction finder needle quivers, swings, then comes to rest. We're dead on track for Point Barrow.

I gaze at the inanimate little sun compass with a feeling of esteem and affection. The $12.50 investment has put on a priceless performance over more than 2,000 miles of trackless ice. The sextant of course had a share in the deed, but only in support of this precise little gadget.

At the 75th parallel we put aside the celestial tools and take leave of the 160th meridian. The nose of the ship is turned a few degrees left on a direct heading for Point Barrow, the northernmost outpost of Alaska, now less than 300 miles away. The magnetic compass begins to act like a steering device again. The radio compass, otherwise known as an automatic direction finder, points over the nose toward the prospective landfall. The weather eases a little and allows a few miles visibility along the frozen ocean. An occasional fissure reveals a glimpse of blue-black water in an expanse of white. Because there is no perceptible horizon, the ice appears to merge indistinctly with the sky. A hundred miles out from Alaska the weather breaks off sharply as if sliced with a giant cleaver. To the south is a cloudless sky with visibility to the brink of the earth's curvature. The break in the weather is a surprise bonanza. The forecast this morning held a different prospect.



Curious RNAF men crowd around *Excalibur III* at Bardufoss, Norway.

A vague outline of rising terrain looms at a great distance. Could that be a mountain range or is it a mirage? Perception of land is often tricky at the end of an ocean flight. The shadow of a cloud on the sea is often mistaken for an island. A formation of clouds sometimes takes on the aspect of a mountain range. Soon it's possible to make out foothills along the lower slopes of lofty mountains. The terrain falls away to the north and then levels out as it approaches what appears to be a coastline. About half way across the ocean to this snowless area is a large break in the ice. If the snowless terrain is actually the coastline, it's rather apparent we're running late, which is perplexing. The last sextant reading showed us within a minute of flight plan. That particular document, so hastily scribbled on the truck fender at Bardufoss, calls for passing over Point Barrow at 2348 on the Greenwich clock.

AT 2347 the radio compass needle swings all the way around and points astern. The sextant is vindicated. We're one minute ahead of schedule. A steep turn allows a visual inspection that validates the radio compass. Directly below on the edge of the tundra is the pattern of buildings which makes up Point Barrow. The large break in the ice, first seen a few minutes ago, turns out to be at the boundary between ocean and coastline. The vast expanse of tundra, snow-covered and appearing from 25,000 feet as a continuation of the ocean line, is as bleak as the Arctic itself.

Arrival over the Alaskan coastline calls for firing up the radio telephone. Repeated calls to Point Barrow, however, evoke no reply. Most likely it's a minor radio lapse. Either the transmitter isn't putting out on that particular frequency, or Point Barrow isn't receiving for some reason. An immediate assessment of the difficulty isn't possible. At any rate the only sensible course is to press on toward Fairbanks and call Ladd Field from some distance out.

The flight plan calls for increasing to maximum engine power for the final 500 miles into Fairbanks, but it seems better to loaf along at our transpolar pace of 325 mph. We'll be a few minutes late but the local air defense at Fairbanks is undoubtedly well alerted to our impending arrival. Even the original operational forecast, sent ahead more than a month ago, has been precisely followed to the day and hour. With or without radio, it should be a friendly reception. Just about everything has changed since last summer's awkward reconnaissance from Los Angeles.

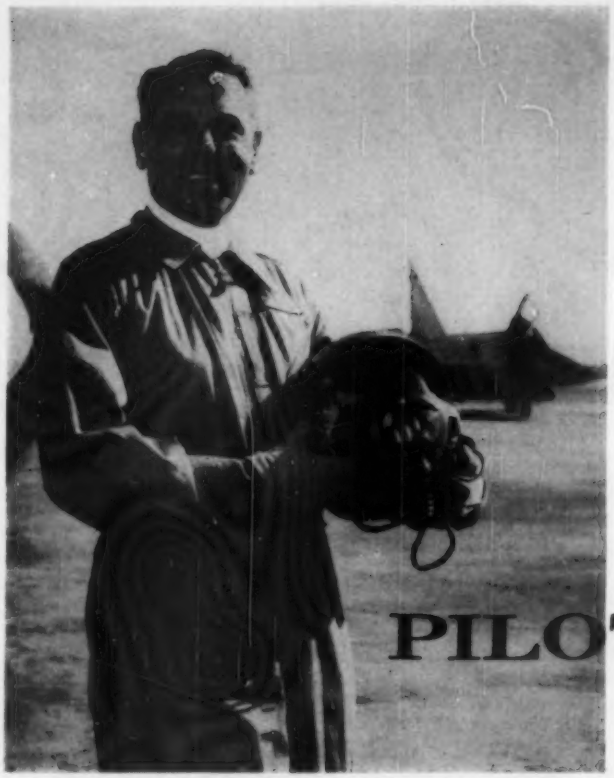
That first distant glimpse of North America almost an hour ago was the Brooks Range. These mountains stand astride the route that tracks in a southeasterly direction toward Fairbanks from Point Barrow, almost bisecting the distance in between. Today these mountains separate winter from spring as *Excalibur* crosses them at 9,000 feet near the crest of Mt. Alapah. North of the Brooks Range is the frozen ice-covered tundra. South of the mountains the ridges and hills show no trace of snow. It has become a gentle summery day with a light haze and an occasional innocuous puff of cumulus cloud.

After ten hours behind an oxygen mask, it feels good to loosen up and get a whiff of the free atmosphere. It also feels good to contemplate unwinding from this tortuous seat. Dropping lower, we fly close to the terrain. It's a pleasant pastime to contemplate the more intimate details of the earth's surface; to see the occasional farmhouse and village close at hand. Every feature is a delight to eyes that have been starving on a diet of arctic waste.

Then at last, Ladd Field is over the nose, its long runway glistening in the sun, beckoning to land. Down there is almost everything a weary traveler could ask for—friendly people, a chance to stand erect again, something for that forgotten stomach, and a bath. In a few hours *Excalibur* will be away again on the last leg to New York, the end of a 12,000-mile circuit.

It's evening back home at Port Washington, Long Island, when the phone rings. Van Sciever, the Pan American Airways dispatcher at Idlewild, is calling my wife. He tells her "Chuck is circling to land at Fairbanks."

The long wait has ended. END



Maj. Gen. J. D. Caldara, Deputy Inspector General for Safety, USAF.

An interview with the general who is responsible for the reduction of the Air Force's major accident rate by 20.7 per cent to an all-time low.

PILOT SURVIVAL

By JOHN V. NEESON

PILOT SURVIVAL in recent months has failed to keep pace with accident prevention. We have made great strides in the latter respect but our ratio of pilot fatality is far too high—one lost for each three major accidents."

The speaker, Maj. Gen. "Smokey" Caldara, lately appointed Deputy Inspector General for Safety, was preparing to move to the Pentagon from his former assignment as Director of Flight Safety Research, with headquarters at Norton AFB, San Bernardino, Calif. During almost five years Caldara has covered the world in search of greater safety aloft and the quest has been phenomenally fruitful. Now he will be in search of safety on an even broader front—missiles, nuclear developments, aircraft maintenance—any and all angles aground and aloft with which the Air Force is concerned.

"We know one reason for the high ratio of losses," Caldara says. "Pilots who face the necessity of bailing out are waiting too long to eject. Almost all unsuccessful ejections have resulted from punching out at too low an altitude."

Interviewing the safety expert, one gets the impression of tremendous dedication to a job. Caldara never has to grope for a statistic or an idea. The facts and figures leap out of his mind at you as though they had been lying in wait to ambush your question. It's said he knows more enlisted personnel than any general officer in the Air Force and it may well be so, for his store of operational lore reflects long hours with the Master Sergeants. "The sure way to prevent accidents is via complete and constant attention to details. The short feathered Indians at the bottom can't always get into the big chief's tepee so I go out among 'em and learn about what's good for snakebite," Caldara says. "They are the boys who bird dog the details. We've been able to maintain a downward trend in accidents despite our conversion to Mach 1 aircraft."

The statistics say that in 1922 military pilots averaged 198 flight hours per major crackup. By 1952 this figure had increased to 2,741 and currently it is approximately 7,000 hours. The flying hours per pilot fatality has jumped since 1950 from 16,152 to 25,768.

Recently, an Air Force aircraft exploded on take-off, because of a missed detail. A fuel tank cap was loose. The pilot missed it on his pre-flight inspection. The crew chief missed seeing it. The refueling crew didn't notice it. One reason was that the line-up markings hadn't been painted on in compliance with a technical order. Caldara says, "There are no little, unimportant details in flying. While conventional aircraft have a certain degree of 'forgiveness,' jet aircraft are terribly resentful of even the smallest error."

We asked, "How about mid-air collisions?"

He answered, "They're dramatic! I don't mean for one second to minimize their importance. I only want you to note the disproportionate effect this type of accident has on the public mind in terms of the overall safety picture. Mid-air collisions are headline makers. Flying is safer today than it ever has been. We can prove it, whether we measure safety in terms of airline miles or hundreds of thousands of hours successfully flown. Mid-air collisions represent the very smallest fraction of our accidents."

Caldara asserts urgent requirement for an airborne anti-collision device. "We in the DFSR recognized this problem long before the famous Grand Canyon and Pacoima School disasters. In fact, we pointed out the need for a cockpit anti-collision device more than five years ago. Both these accidents could have been prevented, had such a device been in existence. There are two factors to be dealt with—the fantastic rate of head-on closing speed in high performance aircraft; (*Continued on page* 68)

THE AIRMAN'S WORLD

Private showing! A spectacular!
Spectaculars are nothing new in the vaulted
theatre where you work.

Recently, you were cruising at sea several
hundred miles off the coast of South America
when suddenly, out of the Pacific
dead ahead of you on a collision course,
towered a snow-capped range of mountains
among the cumulus. Startled and puzzled,
you swung away from your track,
swiftly reviewing your compass changes and
radio checks. You must be far off course and lost!
How could this be? No, it just wasn't possible!
Yet there stood the mountains!

Then it came to you. You were the audience
at another spectacular. You swung back on course
and peered intently at the mirage of the
faraway Andes mirrored on your sky. Atmospheric
conditions, cloud layers and other factors
were just right for good theatre. The same stage
director who positions the stars each night
and wipes the dark off the face of the moon has
arranged his lighting effects for you.
Pilots are his favorite people!

There have been so many evidences of it.
You have seen six simultaneous suns set like
pearls in an arctic sky and have not been able
to choose the one reality from the five images.

You have seen chariots galloping and great
armies marching and the battlements of castles
with pennons flying among
the many hued boilings of the clouds.

And this picture was taken through the windshield
from the catbird's seat—what of it?

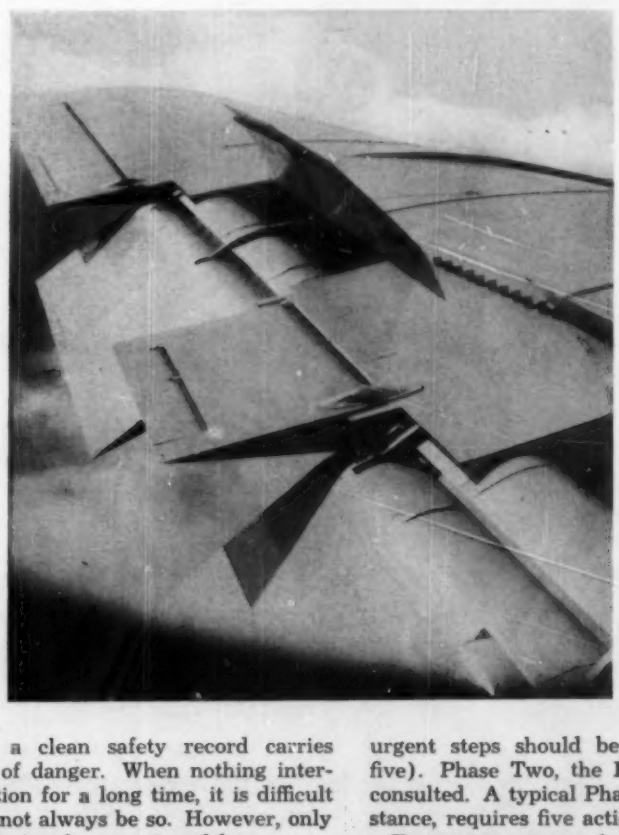
I suspect the rays of the sun are
refracted on the curvature of the glass so that
the illusion of a great star is created
standing above the dark escarpment of the jagged
Alps. But that may not at all be the explanation
of the phenomenon. And little I care.

It's another etching for the walls of
an airman's memory. It's part of my flying pay.

GILL ROBB WILSON

Dennis Stock, Magnum Photos, Inc.

EMERGENCY PROCEDURE FOR CIVIL JETS



Spoilers, as well as flaps, help to achieve the low-speed, high-drag descent which is always desirable in a jet transport.

Emergency gear on aircraft is like life insurance. We really never expect to need it—but, if we do, it had better be there.

by **MARIUS LODEESEN**
Captain, PanAm

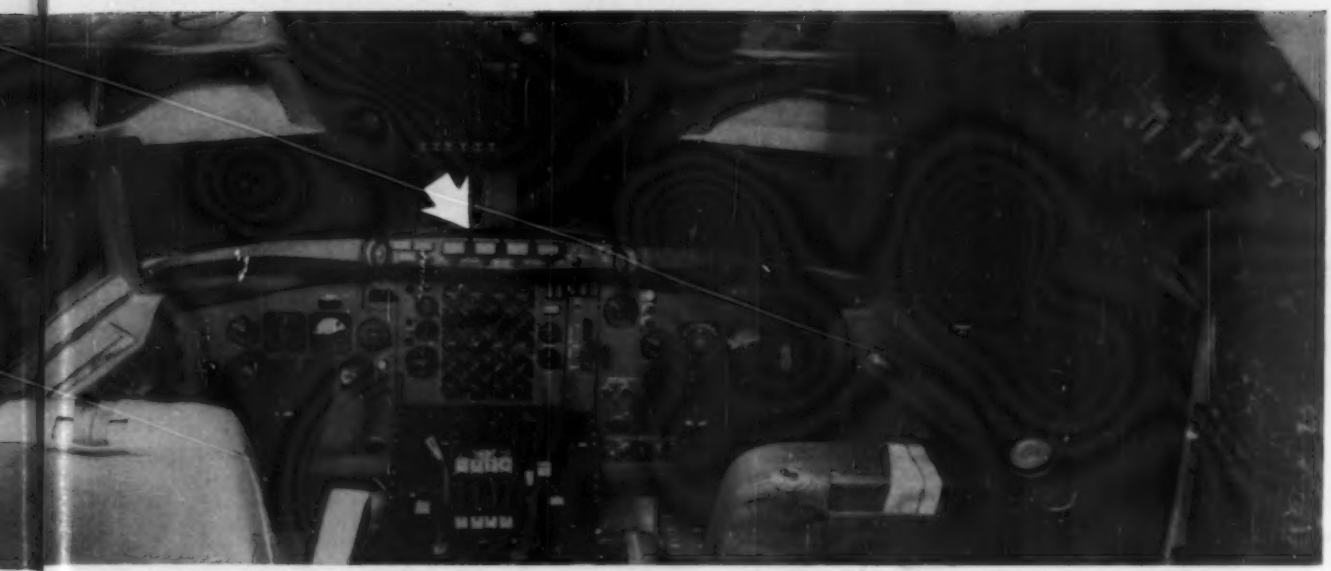
PARADOXICALLY, a clean safety record carries with it an element of danger. When nothing interrupts routine operation for a long time, it is difficult to imagine that this will not always be so. However, only by alertness can we minimize the vagaries of fate.

Procedures and equipment dealing with flight emergencies have been fairly well standardized. Do jets introduce new conditions, different procedures? Fortunately, it does not seem so, except in a few instances.

Foreseeable emergencies have been analyzed. Most require certain remedial actions in a definite sequence. With red lights blinking or bells warning of an imminent emergency, memory cannot be relied upon. Experience has taught that, under stress, memory fails. Combative actions are divided into two parts: Phase One, the most urgent steps should be memorized (never more than five). Phase Two, the Emergency Check list should be consulted. A typical Phase One for an engine fire, for instance, requires five actions; Phase Two, fifteen.

For emergencies such as ditching, we must rely on intensive training and resourcefulness of the crew.

We are happy to be rid of troubles attendant to propellers. With turbojet aircraft we no longer fear failures of propeller pitch mechanism, feathering and reversing troubles or runaway propellers. On the other hand, we are confronted with decompression problems at high altitudes and oxygen supply for the jet's occupants. Perhaps the greatest change lies in the possibility of sudden decompression. The operating environment of jet aircraft is the higher atmosphere. As the atmospheric pressure at 40,000



Fire control in a jet engine is simplicity itself. When a blinking red light indicates overheat condition, the corresponding fire control handle is pulled out, thus stopping fuel flow and extinguishing fire. Here the arrow points to four fire control handles in cockpit of Boeing 707-121.

feet is only one-fifth that of sea level, rapid decompression could be catastrophic. Cabin differential pressures (difference in pressure between inside and outside of the airplane) can reach 1,200 pounds per square foot. Ordinary aircraft structure submitted to this kind of pressure, when punctured, would instantly explode much as a plastic balloon explodes when you prick it with a pin. Jet airframe design has practically eliminated this possibility. Windows have double or triple plates, doors and hatches are interlocking. The fuselage is so designed that cracks or ruptures are confined to small areas, thus allowing decompression to be gradual enough to prevent explosion. This so-called rip-stop design consists of metal strips which prevent crack propagation.

But, although a structural failure at high altitudes need not be explosive, no human being can survive for more than a few seconds in such a rarefied atmosphere. Thus the airplane must be brought down promptly and its occupants must have oxygen available at once.

With piston aircraft we use two methods to make rapid let-down from cruising altitudes—either cut the power, shove the nose down and descend at high airspeed, or lower landing gear and flaps and descend with low airspeed but high rate of descent.

In the case of jet aircraft, the low-airspeed, high-drag descent will always be preferable. With wing spoilers and landing gear fully extended and power off, a pilot can half-roll, to keep occupants from being thrown out of their seats, the airplane into a steep glide at a rate of up to 12,000 feet per minute while keeping the airspeed at a reasonable figure of about 275 to 310 knots. For these seconds of emergency descent, all occupants of the airplane have available masks to deliver pure oxygen. The masks are concealed in panels over each seat and in the lavatories as well. If a sudden cabin differential occurs, these masks drop down automatically in front of each seat. All one need do is press the mask to his face and breathe. The crew up front wear masks around their throats at all times as an extra precaution. Emergency drills using these methods show them to be fully satisfactory. Perhaps they will never be needed under actual conditions.

Emergency passenger oxygen mask drops automatically from overhead panel when there is any sudden change in cabin pressurization.

Emergency landings with gear retracted are always a possibility. Whether on land or on water, and especially if fire be present, the necessity to evacuate occupants expeditiously is obvious. With 150 people in the cabin this is quite a problem. Emergency exits are therefore built, especially over the wing area. These can be opened on either side, but only open to the outside. These exits are very valuable when the plane lands on the water and ordinary doors and exits cannot be opened. For emergency landings on land with gear extended, when we must disembark quickly, ingenious escape slides are provided. These rubber-nylon slides are stowed in the ceiling above each regular exit. They can be instantly dropped outside and inflate in a few seconds by a rope-pull from air bottles under 3,000 pounds pressure. Cabin occupants leave the plane simply by jumping on the slide. They land feet first on the ground. Each inflatable slide can serve 50 persons in 90 seconds. Large planes carry four of them.

Emergency landings on water are extremely rare and highly critical. As yet no jet transport has been "ditched," but many tests on scale models have been made in tanks similar to those used to measure the performance of ship models. Results of these tests indicate that engine pods and wing flaps would tear away upon contact with the water—fortunately—for otherwise the pods might carry the wing with them. Every type of aircraft has its own ditching (*Continued on page 60*)

CANADA'S FLY-IN

Section of the Albany River known as Kagiami Falls, where the air-minded adventurer may catch big brook trout all summer long.

IF YOU DON'T get a good fish here on your first cast," Randy MacDonald said, "we'll climb back into the plane and go someplace where the fishing is better."

I snapped a small red-and-white spoon onto my spinning rig and tossed it out into the quiet cove. The water was black and deep. I let the spoon sink a trifle and began the retrieve. About halfway back I felt the strike. My rod jumped and danced. I sneaked a look at Randy. He was grinning.

The fish came into sight, a fat pear-shaped shadow in the dark water. It lunged under the boat, turned tail and surfaced in a sudden froth of flying spray. I led it toward the stern. Randy took the line in his right hand, made a quick dip with his left and held up the fish. It was a three-pound walleye, gleaming yellow along the sides, with a small head and thick middle. And that was my introduction to a new kind of angling adventure now being offered in many places in Canada—fly-in fishing.

For this kind of fishing, your pilot sets you down in tested waters. There is no doubt about them, as was proved to me that warm July day last summer on Lake Bamaji, deep in the Ontario bush northwest of Lake Superior. The spots aren't fished enough to make a dent in the finny population. As sure as anything can be in fishing, you're going to get your money's worth in big, fast action on a fly-in fishing trip.

There's a triple reason behind the spurt in outpost fishing that has boomed in Canada in the past several years. Angling pressure in the United States has increased steadily, pushing the fishing frontier farther north and creating a demand for outcamps deep in the Canadian bush. Prospectors exploring the country in search of mineral wealth have sent back reports of fabulous sport in dozens of lakes and rivers never before investigated. And, finally, many of Canada's small, struggling bush pilots in recent years have become prosperous businessmen on the strength of freight contracts for military construction and mineral search.

These small charter operators fly the best planes money can buy, Canadian Beavers and Otters, American Cessnas, Pipers and Beeches. They are diversified businesses, depending on volume to keep them going. With volume have come lower rates. You can take a flying fishing trip into the bush today for about (*Continued on page* 58)

Lake Bamaji is just 40 minutes by float-plane from Sioux Lookout, Ontario, and offers incredible fishing. Boat is available at the dock.

A new kind of fishing adventure awaits the angler in hitherto inaccessible lakes.

FISHING

By WOODIE JARVIS

Above: Happy Izaak Waltons display one day's catch from Lake Bamaji.

Below: Typical outpost camp, 20 minutes by air from nearest city.

THE PRO'S NEST

Indicated altitude, pressure altitude, true altitude, and density altitude—each of them has a different purpose and meaning.

ALTITUDES

By EUGENE F. TIMPE

NOT LONG AGO a non-professional pilot who had been fishing in the California Sierras attempted, on a warm summer afternoon, to take his twin-engined plane off the runway of one of those Forest Service airstrips. The plane's performance should have been adequate, even with a full load, to get off this strip, although it was 8,000 feet high. Yet the plane ran out of runway and crashed on take-off. Why? Just lack of knowledge, plain and simple. The pilot probably thought that altitude was altitude, no matter what the case. He may have had a vague idea that hot air is light and cold air is heavy, but he just didn't take the trouble to figure out that at 8,000 feet altitude, and at 80 degrees Fahrenheit, the air is as thin as that at 11,000 feet! And at 11,000 feet his airplane would, of course, need a lot more runway—about half again as much as it needed at 8,000. This accident might have been prevented, had this pilot known about *density* altitude.

The altitude signs on the control towers, and next to the airport symbols on the maps may say one thing, and what they say is perfectly true as far as it goes; but the actual thickness or density of the air in which the plane is flying may correspond to quite a different altitude, and it is according to this "density" altitude that the airplane flies. In Palm Springs, Calif., the airport is listed on the map as being 448 feet high. On a day when the temperature is merely 104, a cool day during the months from May to September, the density altitude is 3,500 feet! Without knowing it, then, a pilot can be flying in air as thin as that several thousand feet higher; or in cold weather, as thick as that about the same amount lower. In terms of aircraft performance, particularly a lightplane with a fixed propeller and unsupercharged engine, this could mean an extra margin of performance and safety—or disaster.

Altitude doesn't mean exactly the same thing to your plane as it does to the map-makers, and as a pilot you should know the difference. Your airplane performs according to density altitude, or air thickness. Heavy, cold air provides a thick medium to make an airplane wing provide lift, an engine to develop power, and a prop to provide pull. Hot, thin air works just the other way. This air density differs from place to place and time to time, due to the movement of high and low pressure areas and changes of temperature and humidity. Maps read in true altitude, which of course, doesn't change. Knowledge of both of these altitudes, true and density, is important for any pilot, for true altitude tells the exact height of something above sea level, while density altitude tells how the airplane thinks it is.

Before you can figure out the density altitude, however, there is another altitude you must know. This is the pressure altitude, and it is simple to find. All you need do is first note the present altitude reading on your altimeter, then turn the knob so that the setting of 29.92 appears in the pressure window. Your altimeter then reads pressure altitude. This altitude can be used to help you determine the horsepower output of your engine, your true airspeed, or your density or true altitude. Pressure altitude isn't anything but a term used to describe pressure—that pres-

sure, measured in feet, which the atmosphere is exerting at that time and place. This would not be the true altitude unless "standard" conditions existed, and they almost never do. But knowing the pressure altitude, and knowing the air temperature, you can correct the pressure altitude for temperature (almost any computer will do the job) and find the density altitude. Simple, isn't it? All you really need is four pieces of equipment: an altimeter, a thermometer, a map, and a computer. These are all pretty essential for cross-country flying anyway.

Let's stop here for a minute and take a good look at the altimeter. Actually, it is just a mechanical barometer which registers air pressure, on a clock-like dial, in terms of feet rather than inches of mercury or pounds per square inch. It could just as easily be set to read either, but then it would be called a barometer, or "pressure measurer" rather than an altimeter or "height measurer." The higher you go, the lighter the air gets, and it is this difference in pressure which activates the altimeter. Unfortunately, the air isn't always uniformly of the same pressure at a given altitude, nor does the temperature always decrease uniformly the higher you go; otherwise your altimeter would always give you the true altitude, pressure altitude, and density altitude, since they'd always be the same.

In order to fill in the complete picture, you should know that temperature affects the density of the air directly; cold air is heavy and dense, hot air is thin and light. As far as your airplane is concerned, hot or moist air is light and thin just like high-altitude air.

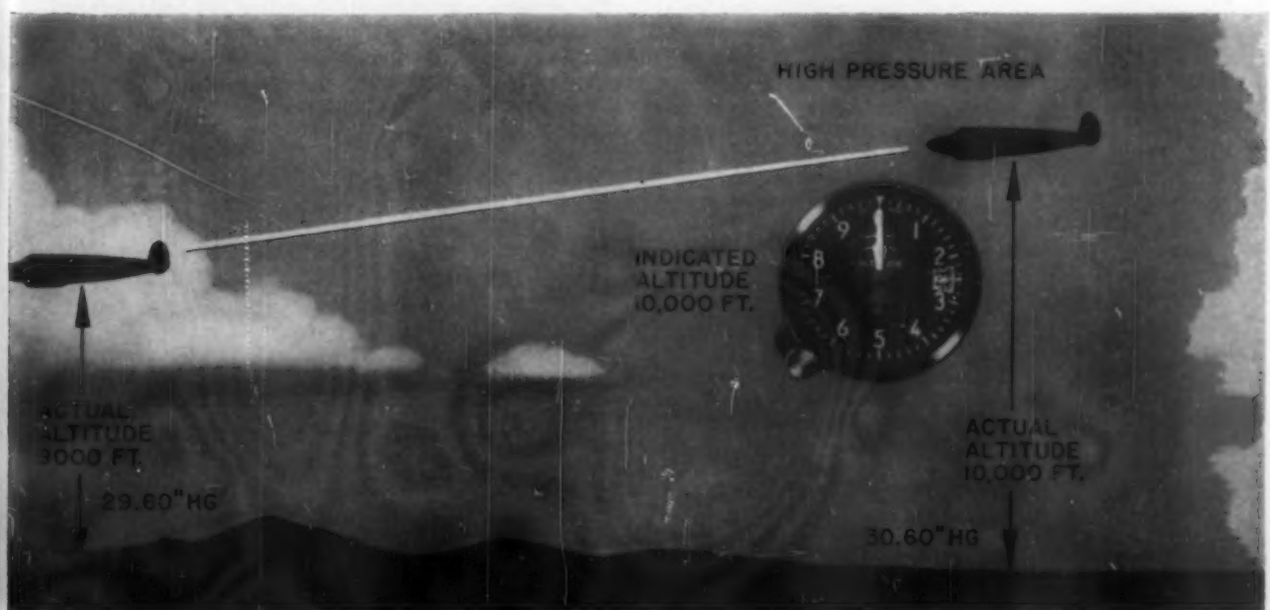
Not only can these differences in pressure and temperature affect the performance of your plane, but they can also put you into some tricky situations without your even knowing it. Suppose, for example, that you were flying from a high pressure area to a lower pressure area. As you flew from one to the other you would try to stay in layers of equal pressure, which to your altimeter means constant altitude. Since any pressure layer in a high pressure area is higher than a layer of that same pressure in a low pressure area, you will lower your actual altitude just so you can keep your apparent altitude constant.

At the position to the right in the illustration, the plane's altimeter reads the same as it does at position to the left, yet the plane's true altitude is lower in the low pressure zone. Thinking you are higher than you actually are could be dangerous, especially over mountains, while on instruments, or at night. On the other hand, if you flew out of a low pressure area into a high pressure area your altimeter would show that you were losing altitude if you maintained level flight, so naturally, you climb from the layer of pressure in the low zone to the layer of the same pressure in the high. A safer situation this time.

Since in its effect upon density, high temperature is like low pressure, and low temperature is like high pressure, the same holds true if you fly from a cold zone to a warm zone. That is, your altimeter would show that you were higher than you actually were. But here is a joker. If you fly just in cold air, your altimeter will show that you are higher than you are; and the more altitude you get the more in error your altimeter will be. Why? In cold weather the air is more dense, as we already know, and consequently there will be a greater *change* of pressure vertically. Instead of losing about an inch of mercury for every thousand feet you go up, you'll lose a little more—maybe an extra tenth of an inch. At 10,000 feet then, you've lost about 11 inches of mercury and your altimeter reads as if you were at 11,000! The reverse is true for hot weather. That is, when the air is hotter than the standard 59 degrees Fahrenheit at sea level, you are higher than you think.

In case you're not sure whether you are flying in something close to standard temperature and pressure conditions or not, or whether you have passed from one pressure or temperature area to another, you'll want to find your airplane's true altitude. How can you do this? Here again you'll need your computer and thermometer. You'll have to know three things: your air temperature (in degrees Centigrade); your pressure altitude (which you get by turning the knob until it reads 29.92 inches); and your *indicated* altitude. Knowing these things, you can find your true altitude on any computer.

But what is "indicated" altitude? Without knowing it perhaps, this is the altitude which you use most often. It is the altitude you get when you set your altimeter for field elevation before you take off, or when you get an "altimeter setting" in inches of (*Continued on page* 86)



They were rugged individualists—
the boys who jumped 'chutes and walked wings
in the old barnstorming days.

CALL ME PANTLESS

By RUSS BRINKLEY

OF ALL THE PARACHUTE jumpers who traversed the cow pasture circuit in the OX-5 era, none was more colorful than Charles, "Smiles" O'Timmons. A great breach may exist between O'Timmons "leap for life" and the modern precision of the famous Sky Divers team but, as an air show attraction, Smiles never failed to bring in the spectators.

Actually, he turned to parachute jumping after being incapacitated in a dive from a 100-foot ladder to a shallow water tank. For several generations the O'Timmons family had been professional stunt people—headliners at county fairs and exhibitions. The dynasty was ended when Smiles struck the side of a tank and lost a lot of weight too suddenly—an arm and a leg being major items. The tank and ladder were sold as surplus. As soon as O'Timmons could get about, he bought an artificial leg, and a war surplus balloon chute. Soon he was a star in a new business.

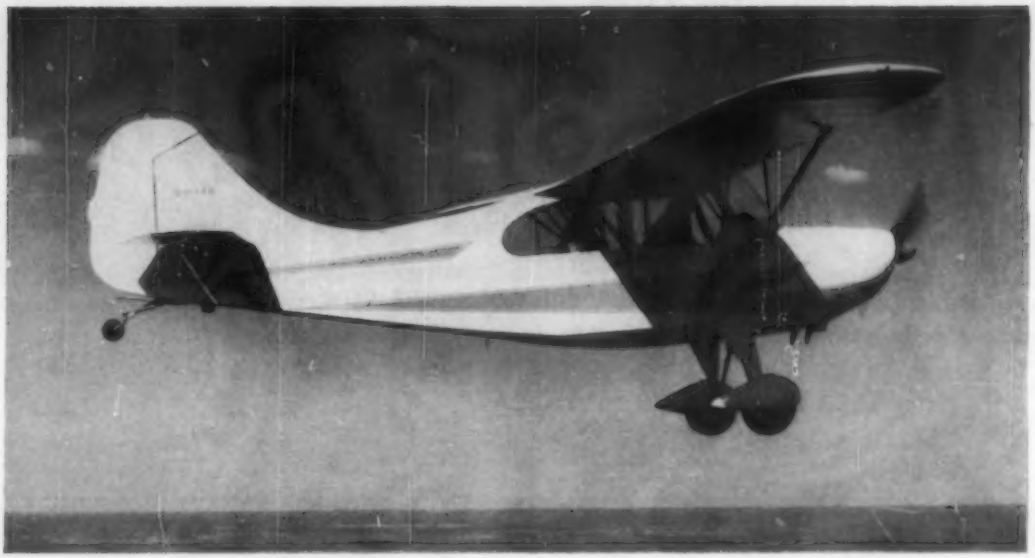
For a time, Charles made his leaps for life from a gas balloon but two considerations prompted him to switch to Jennies and Standards. First of all, the shroud lines of the balloon chutes were attached to a metal ring about the size of an auto steering wheel. Each time O'Timmons landed, the heavy metal ring would drop onto his head and render him temporarily hors de combat. This procedure became monotonous. Smiles started wearing a football helmet but that seemed a bit sissified.

The second consideration was the high cost of new artificial legs. They had a habit of buckling when the stunt man made a rough landing, so Smiles switched to airplanes. The Irvin backpack was just coming into vogue and anyone with $375 in cash was entitled to own one. O'Timmons became the proud possessor of a backpack but, on his very first delayed-opening jump with it, he lost an artificial leg again. It plummeted 1,500 feet and crashed through the top of an old sedan, parked at the airport. The two passengers sitting in the front seat of the car were not even scratched but Smiles was mortified and after that always removed the mechanical leg before he took off.

The promotion value of hiring a handicapped stunt man for a series of air shows, occurred to me while watching a one-day barnstorming exhibition in which O'Timmons was the feature attraction. Loudspeakers were still unknown and I heard Smiles make his collection pitch through a small Rudy Vallee type megaphone. After the crowd had made its contribution and O'Timmons had stashed the dimes and quarters in his money belt, he climbed up on the lower wing of an OX-5 Standard and stretched out. The Standard took off. Climbing into or out of a cockpit was quite a chore for him in those days. It was easier to ride the wing and roll off when the time came.

The advance man of the air show that day had prevailed upon the farmer to graze a flock of sheep previously on the grassy runway so the ground would be firm and the grass short. This was a good idea but the farmer failed to clear his flock from the premises before the airplanes arrived. To handle the situation, the air show manager provided free airplane rides to two local boys whose job it was to keep the mutton out of the maneuvers. The boys performed to perfection until Smiles mounted a gas drum and launched his spiel. The young shepherds were lured from their flock and the sheep scattered.

Once the Standard got into (*Continued on page* 82)



FLYING

CHECK PILOT REPORT ON THE

CHAMPION SKY-TRAC

The lines look familiar but this new model of an old favorite incorporates many desirable features.

By TED DUROSKO

WHEN I FIRST saw the Sky-Trac circle the field at Lost Nation Airport, I recognized it by the familiar lines of the Champ family, although it was scooting along faster than any Champ I had ever seen. However, as it swung on to the approach leg, its speed lessened to a slow glide and it touched down and stopped rolling in some 200 to 300 feet without use of flaps—a really high-class performance.

After the plane had been parked, I walked over to take a look and found it had been flown by Woody Coche, Champion's Eastern Sales Manager. Within minutes we were deep in shop talk about the airplane that had fired my curiosity. Woody, who had flown the Sky-Trac from his base at Detroit City airport that morning, pointed out some of its features as we made a walk-around inspection.

I found the reason for the 120-mph cruise speed as soon as I unbottoned the cowl. Mounted compactly up front is a Lycoming 0290-D2-B, 140-hp engine which turns a standard pitch metal prop. Its maximum take-off rpm is 2,800 (five minutes) and maximum cruise is 2,600 rpm. Later I found that with 2,400 rpm the Sky-Trac cruised 120 mph and climbed well at 2,500 rpm.

The author studies Sky-trac's sloping panel which can accommodate all instruments needed for blind flying.

Fuel for the engine is carried in two wing tanks which hold a total of 39½ gallons. The two tanks are tied together and one fuel gauge reads total fuel aboard. The fuel valve is a simple off-on type. Also I noticed that the fuel tank vent is on top of the wing. In this location fuel is less apt to spill out when taxiing with full tanks as when the vent comes out the underside.

To handle the larger engine and heavier gross, 1,650 pounds, the Champ is a rugged airplane, built under CAR part 4a. Continuing the inspection, I found the engine cowl nose bowl to be made of fiberglas, as is the quick-jettison door. Standard equipment on the Sky-Trac are the wheel pants, metal prop, jet-flow spinner, complete electrical system including position and landing lights, fully shielded ignition system and hydraulic brakes.

At this point I climbed into the front seat of the plush cabin. Harmonizing colors of the carpet, upholstery and foam rubber cushions are pleasing. The front seat is adjustable—maximum comfort for the pilot. All controls and switches are easily within reach from the pilot's seat. The master switch, position and landing light switches, ignition switch, carburetor heat control and fuel valve are grouped on a metal panel located on the left wall between the two tandem-arranged seats. Elevator trim control is located overhead and starter, mixture and cabin heat controls are on the front panel.

Before starting the engine, I mentally reviewed the specific points that I wished to cover on the flight check, in that the Sky-Trac can be used for personal transportation, freight, spraying or dusting. (*Continued on page 74*)

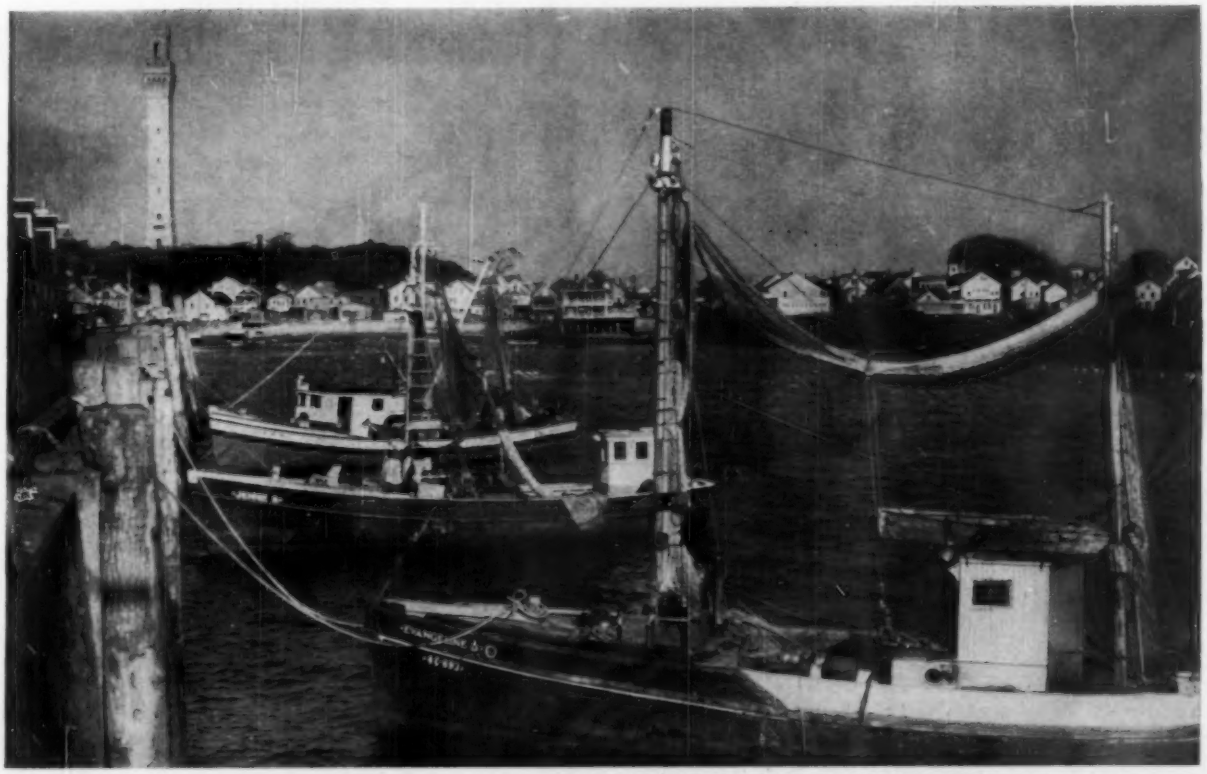
AIRMAN'S HOLIDAY

CAPE COD

Katama Airpark on Martha's Vineyard.

This renowned, historic settlement and resort area is especially attractive and accessible for a fly-in vacation.

By NOVETAH DAVENPORT
Associate Editor



Harbor at Provincetown on the very tip of Cape Cod. It was here that the Pilgrims anchored in 1620 and the Mayflower Compact was composed.

TO MENTION CAPE COD, to those who know it and to those who have dreamed of it, is to conjure a kaleidoscopic picture of mile upon mile of white sandy beaches, of sand dunes, windmills and lighthouses, charming early New England homes and ancient shrines; groves of pine and hardy oak trees, and a profusion of flowers. A place drawing thousands of vacationists annually where art colonies, summer theaters, golf, swimming, sailing, fresh and saltwater fishing, big red lobsters and steamed clams dripping with melted butter, are all part of this renowned historic settlement and resort area. Included in this picture, of course, are also the equally popular and picturesque offshore islands, among which are Martha's Vineyard, Nantucket, and Elizabeth Islands to the south—all with their own special flavor.

A peninsula, shaped in the form of the human flexed arm, the Cape is 65 miles long, 20 miles in width at its widest point. It is severed from the mainland by the Cape Cod Canal which joins Buzzards Bay to Cape Cod Bay, affording a shorter and more protected passageway for coastwise marine travel than that of the outside course around Provincetown via the rugged Atlantic Ocean.

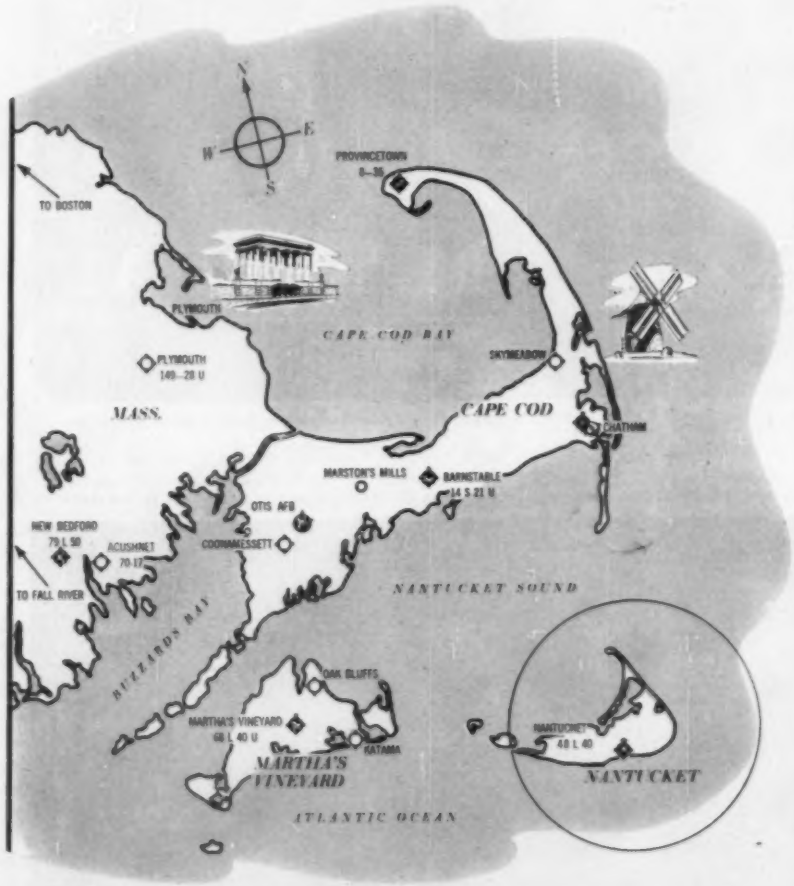
It is approximately 85 miles by highway between historic Plymouth, where the pilgrims dropped final anchor in the New World in 1620, and Provincetown at the very tip of the Cape, where the Mayflower paused before sailing the last leg across Cape (*Continued on page* 87)

Oak Bluffs Airport on Martha's Vineyard.

Provincetown Airport.

Orleans Airport, on the west shore of the Cape.

Marstons Mills, one of the oldest on the Cape.



Chatham Airport at "elbow" of the Cape.

The Municipal Airport at Hyannis.

Instrument runway at Nantucket Airport.

Plymouth Airport.

Martha's Vineyard Airport.

Bolling Field, developed from an acreage known as "The Flats," looked like this in 1924. Three Martin Bombers hold a loose formation.

Below: Bolling Air Force Base as it appears today on the bank of the Potomac. Washington National Airport is visible across the river.

A famous old airport, serving the nation's capital, bears the name of Col. Raynal Cawthorne Bolling, the first high-ranking American officer to lose his life during World War I.

TO A PIONEER HERO (Bolling Air Force Base)

By JOSEPH VOLNEY

DEDICATED TO THE MEMORY of the first American officer of high rank to die under enemy guns in World War I, Bolling Air Force Base lies across the Anacostia River from the national capital on a plot of flood-deposited acres traditionally known as "The Flats."

The military history of the site goes back to the war between the states. In 1863, The Flats was leased from its private owner, George Washington Young, and utilized as a Union Army Cavalry supply depot during the remainder of the conflict and subsequent reconstruction days. In those times the area was much less extensive. Intervening years have built up the plot as flood waters of the Potomac and Anacostia rivers have deposited their silt.

When World War I opened in 1917, the seat of the national government had no aviation facility. It was a little farfetched to think that Washington needed air defense in that era but, after all, the War and Navy Departments did include aviation in their organizations. It seemed a little incongruous that their headquarters had no utilization of whatever service aviation could provide. The parade ground at Fort Myer, where military aviation was born, was by now both inadequate and unavailable. The Army flying field at College Park, Md., was too far distant to be of practical service, or as even a place where flying officers stationed in the War Department could practice their skills.

In 1917 then, with defense funds more available than in peace time, the War Department, through the Corps of Engineers, purchased The Flats, by now almost 350 acres in extent. The new purchase was immediately turned over to the Aviation Section of the Signal Corps for development as "an airplane landing field" and work of grading, draining and construction of buildings begun.

The career of Bolling Field very nearly ended with the close of the war, in a drive for defense economy. Its situation was further complicated by agitators within the Air Service for a more adequate facility somewhere else. Bill Mitchell stepped into the breach and saved Bolling, being fully aware that the possibility of getting something better was a bad gamble.

As the years after the war accumulated, the expansion of aviation, added to the constant trouble with overflow from the river, made the limited conditions intolerable. So, in 1930, the War Department purchased an additional 345 adjoining acres from the Washington Steel and Ordnance Company. Construction of a new field on this area was inaugurated several years later and the Army Air Corps moved into it from the old site. In 1940, the original acreage was turned over to the Navy, which had been a rent tenant since the inauguration of the field. Anacostia Naval Air Station is now located there.

To recount the famed characters who have passed through the portals of Bolling, or the organizations which have called it home, would be almost akin to calling a role of recent history. The establishment of Armed Forces Day had its origin at Bolling with inauguration of a National Army Air Tournament in May, 1920. The Army Air Forces, activated in June 1941, under command of Maj. Gen. H. H. Arnold, was based there. The Twelfth Air Force, which left its mark on North Africa in World War II, was born at Bolling. The Ferry Command, out of which came the Military Air Transport Service, originated at the base. For a time after the war, Strategic Air Command headquartered on the field. For many years it was used by the Civil Aeronautics Administration, the erstwhile Bureau of Air Commerce. From old Bolling, diplomats and statesmen took off (*Continued on page* 77)

LITTLE PLANES -

LUMBERING HAS BEEN the backbone of Maine's economy since the area was first settled by white men, although the industry has changed radically since the day the British Government laid claim to all "mast pines" for the ships of the Royal Navy.

That was the age of the axeman; saws as we know them had yet to be invented. Evolution of the cross-cut saw, years later, gave the first volume impetus to the opening of the remote northern areas and brought about the era of the "Lumber Barons"—speculators who made and lost fabulous fortunes by investing in large tracts of virgin timber, gambling on their ingenuity and luck to drive the logs down the rivers to the sawmill towns of the coast.

Late in the last century, a few paper mills were built in Maine and "pulpwood" got its original feeble foothold. Since then, the pulp and paper industry has grown with such acceleration that currently it ranks as the fifth largest industry in America. In the forests of Maine today, pulpwood is king. More than two million cords were harvested last year.

In 1898, when this industry was still in embryonic stages, a number of mills in New York and New England were merged to form the International Paper Company, now grown to be the largest such in the world, its subsidiaries extending throughout the United States and Canada.

In Maine, IPC operates two major holdings—the Otis Division of two pulp mills and one paper mill—and the Maine Woodlands Department. The Otis plants are all located on the Androscoggin, with the main plant at Chisholm. The Woodlands Department, with headquarters at Chisholm, owns 875,000 acres of forest—not one of Maine's largest landowners, but one long recognized as a pioneer in scientific forestry management.

This pioneering was born of necessity, for the bulk of the company's acreage lies in the wild Allagash and St. John River region. This wilderness, some 10,000,000 acres in northwestern Maine, was long inaccessible, save by canoe in summer and snowshoes in winter. Furthermore, IPC holdings are scattered over an expanse 250 miles wide by 350 long, spanning the state from Quebec to New Brunswick boundaries; and touching the northern tip of Maine near Ft. Kent.

Needless to say, this situation presented almost insurmountable problems of transportation. A crew could spend days just getting into the back-country and then spend weeks or even months surveying the woodlands. In 1946, the lands on the headwaters of the St. John, along the Quebec boundary, were opened up. Since there were no roads on the American side, access to the area was possible only by crossing into Canada at Jackman, Maine, traveling the dirt "range roads" of back-country Quebec, and re-entering Maine near the Canadian settlement of St. Aurelie. Obviously, this was a very inefficient operation. On the other hand, over 350 square miles of timberland for IPC pulpwood operations was at stake.

Of course this situation was tailor-made for a man with an airplane. The man was a veteran woodsman, G. M. Blaisdell, Resident Manager of woodlands in Maine and long with IPC. Early in his association with woodlands, he foresaw the advantages of an aircraft to the company's far-flung operations. He became a pilot.

His chance came with the opening of the St. John area in 1946. Through his efforts the company acquired its first aircraft, a float-equipped J-3 Cub. Original intention was to use the plane for "cruising." Those first "cruising" flights were relatively crude, by present standards. The company had no aerial photographic equipment.

Opposite page: Crew loads pulpwood on one of company-developed "truck-trailer-train" rigs in upper St. John region.

Maine's oldest industry—lumbering—goes modern, thanks to the vital role played by the lightplane in its development.

By PAUL J. FOURNIER

BIG BUSINESS

"Cruising" consisted of flying an experienced forester, usually Blaisdell, over an area for an educated guess. It was soon found that an expert aloft could make amazingly accurate estimates. The woods operation roared into high gear. It also became apparent that the airplane was invaluable for additional uses. The International Logging Corporation; a subsidiary of International Paper, was organized to carry on the St. John operations. Mr. Blaisdell was named Manager, and his son, George, Superintendent. The father-son team found that the aircraft cut supervision problems by at least half, enabling the two to do a volume of work that would otherwise have required four men.

Gradually the aircraft assumed a supply role. A modern large-scale lumbering operation employs a large variety of heavy equipment—trucks, cranes, loaders, snowplows, bulldozers, tractors. A healthy stock of spare parts is maintained at the main camp, but quite occasionally, it does not suffice. Since the St. John Division is at least 300 miles from the nearest major supply cities such as Portland and Bangor, the lack of a critical spare part is of major economic importance. Countless times the airplane paid for itself by being Johnny-on-the-spot in this respect. On several occasions the hurry-up errand involved transportation of an injured man and the little airplane became worth its weight in gold as a morale builder.

The increasing demands on the plane soon called for a larger ship. In 1949, the Cub was replaced by an Aeronca Sedan. The Sedan is, even now, the most popular "medium powered," four-place airplane in Maine bush-flying circles. Pilots praise its ability to "handle a big sea"; and its astonishing payload on floats. Shortly after its acquisition, the ship was modified for photographic work and experiments were made in photomapping. Two men, pilot and photographer, flying from 10:00 a.m. to 2:00 p.m. could in one day do an amount of surveying that would take a six-man crew two weeks on snowshoes. The company currently has its aerial surveying done by a commercial outfit.

The Sedan hit the jackpot of utility in 1953. An epidemic of hoof and mouth disease in Canada put a ban on shipments of livestock and meat through all Ports of Entry between Maine and Canada. The Blaisdells had an average of 650 employees in the St. John Division at the time. Since the supply trucks had to go through Canada to reach the Division, the situation was critical. The Sedan was turned into a meat wagon and supplied all the meats for the 650 men for six (*Continued on page* 64)

Typical timber stand of the Allagash Watershed, part of a 10,000,000-acre wilderness in northwestern Maine.

WINGS FOR

Normally a strictly military force, Army National Guard aviation also serves the home, community and State.

By WILLIAM V. KENNEDY

OF ALL MILITARY AVIATION, no element is so thoroughly grounded in the grass roots of the country, or so much a part of nationwide community life as that of the National Guard—both the Air Guard and the tiny units of pilots and mechanics who man the organic air activity of the Army ground organization. These latter citizen soldiers are they who fly the "little" planes, the ones that are counterpart to the aircraft of general aviation—the kind of planes with which the private pilot is most familiar.

Their job is of the "chore" variety and it is infinite. They are the eyes and ears and hands that go far to all defense effort together at the local level. Not much is heard or written of them because their activity is never en masse and usually within a restricted area. Normally they function in a strictly military capacity, specializing on the kind of activity required by the unit of which they are a part—Infantry, Armored Cavalry, Signal Corps, Engineers, or Artillery. But frequently they function in civil emergency and it is then that we begin to realize and appreciate their existence. We could pick out a unit almost anywhere as an example. One from the Keystone State will do as well as any.

At Taylor Airport, New Kingston, Pa., a farmer, a bus driver, an aviation mechanic and a State employe each spend some 50 to 60 hours per month and 16 to 18 consecutive days during the summer, training to maintain professional efficiency. With two Cessna L-19 "Bird Dogs," they constitute the Aviation Section of the First Battalion, 104th Armored Cavalry Regiment, Pennsylvania National Guard. First Lts. Lee R. Sunday and Samuel M. Caldwell, together with Sp/2 Thomas J. Mullaney and Sp/3 Edward F. Alexander, are four of a total of 2,100 specialists throughout the United States, Hawaii and Puerto Rico who constitute the personnel of organic aviation in the Army National Guard.

During the severe blizzards of late last winter, they, in common with many Army Guard units, turned their military skills to meet civil emergency, patrolling high tension wires to locate breaks; air dropping food and medical supplies to isolated farm houses; spotting stranded motorists; laying wire for emergency communications; evacuating injured or flying in medical personnel; and dropping or picking up messages where no other means of communication was available. In floods, forest fires, and countless instances of a vast variety, this lightplane fleet of defense, scattered in small flights in every corner of

THE ARMY GUARD

Above: Regular Army and Army Guard aviation "team" listens as regular Army Link instructor explains a problem. Below: Lt. Leighton Elliot holds Bell H-13 on the ground, as North Carolina Guardsmen load "wounded" comrade aboard.

Above: Light Aviation with atomic-armed missiles "on call" supports the hard-charging armored column. Below: Full-time North Carolina National Guard mechanics, Sgt. Nyle C. Hart, left, and Sp/2 Floyd Taylor check an engine.

the land, has paid for itself many times over in civil as well as defense dollars. Important as these services are, they are only incidental to the primary, tactical mission.

When Hitler's legions lunged into Poland, Belgium, France and Holland in 1939 and 1940, they succeeded because of a skillful "marriage" of airpower to a new concept of armored warfare. In the years since, Armor, a complex combination of tanks, armor-protected infantry and artillery and even increasingly armor-protected supply and maintenance columns, has emerged as land power's strong arm. The vital air element of the "blitzkrieg" team, however, has moved to the very edge of space and to speeds that make effective cooperation with the ground armored striking forces difficult or impossible. So light aviation and atomic-toting rockets now fill the gap.

Today, the L-19, the L-20 "Beaver" and the helicopters are the scouts and videttes of America's atomic-age Cavalry. The National Guard has been given the mission of organizing and training the bulk of America's armored forces. Each of the six armored divisions, nine armored cavalry regiments and independent armored groups involved in this program is authorized, at present, anywhere from two to 30 light aircraft and helicopters. In addition, each of the Guard's 21 infantry divisions is authorized 26 light aircraft and helicopters. The total is swelled even further by flights assigned to independent artillery, medical and support groups. Under the "Pentomic" reorganization scheduled to take effect during the next two years, the Guard's infantry formations will be welded more tightly into the armored team. This will result in doubling the authorized number of light aircraft and helicopters.

Today, the Army Guard flies 775 aircraft and helicopters. Included are L-19s, TL-19D trainers, L-20s, L-23s, H-13s and H-23s. Assigned to the operation of them are 1,188 pilots and approximately 1,000 mechanics on either full or part-time duty. (*Continued on page 72*)

Trussed like a turkey, the drugged Nebu is hauled slowly up the ramp into author's Cunningham-Hall ski-plane. Inset: Vets administer tranquilizing drug.

An intrepid bush pilot devised a daring rescue of four snow-bound horses from the mountains of central Idaho.

By JIM LARKIN

OPERATION HORSELIFT

SNOW LAY heavy over the rugged mountains of central Idaho. For ten days, a series of pre-season storms had swept the high country and the passes were choked beyond possibility of use. I already had put skis on my plane.

In the narrow, rock-rimmed valley of Sulphur Creek, four horses pawed endlessly trying to dig down to the sparse, frozen turf under the drifts. Rancher Ben Morgan watched the poor trapped beasts, and knew he had no choice. Like other ranchers in years past, he had either to watch them weaken and die of starvation, or mercifully shoot them. About to decide on the latter course, Ben suddenly had an idea.

Sixty miles from Sulphur Creek, in the little mountain village of Cascade, the telephone jangled. Weary from a hectic day of canyon-floor cargo drops, and a series of tight take-offs from the tiny, snow-sodden airstrips of the back-country, I picked up the telephone and jotted down the feeble, relayed radio message.

"Four horses snowbound; starving." Would I try flying them out in my Cunningham-Hall?

I had lugged some unbelievable loads in ten years of bush flying. I remembered the refrigerators hanging half out in space—how I had to hold full rudder to stay in the air; the crates of window frames lashed on top of the fuselage; the hay baler that hung out so far it almost dragged the ground; but—horses!

I took a quick mental look at the oversize door of my Cunningham, and, "Okay, tell Ben I'll give it a try."

I called Dr. Bill Ewing, top veterinarian from Boise. He was on the job next morning to help out. It was his opinion that we should anesthetize the horses for the trip. He explained that this was perfectly feasible and highly advisable from a safety standpoint. They should remain asleep throughout the flight.

We loaded our equipment in the Cunningham, and half an hour later, slid to a stop in the deep snow of Sulphur Creek. Shortly thereafter, Doc, with the savvy professional technique of an old-timer, had a rope shackle on Nebu, a stocky Arabian, and (*Continued on page* 85)

Tips to Tyros

ALASKA BOUND

In line with the great public interest now focused on our newest member of the union, many private pilots will be planning to fly there in their own planes.

By LT. COL. BOB CRAWFORD, USAFR

SOME 200 PRIVATE planes will cruise from Miami to Fairbanks this summer. From California, Craig Wilson, president of The National Flying Farmers' Association, will lead another hundred. These flights reflect the great public interest in Alaska, the state with more private fliers per capita than any other.

Born and raised there, and having flown the route in light aircraft as far back as 1932 and as recently as last summer, I judge a few hints may serve good purpose.

Be absolutely sure your equipment is in top condition. Once you leave Seattle on the west coast or Great Falls, Mont., the highway route, you are your own A & E and radio mechanic.

Have all the WAC charts, latest editions with the Alaska Highway in red. They are not procurable en route.

If you live on the west coast, you may fly to Vancouver, B. C. and, with good weather, fly VFR over the railroad to Prince George. Recently I was cleared VFR; found the valleys completely fogged in; no sight of the railroad. By dead reckoning, I made it.

If flying from the east, land at Great Falls and check everything. Your next good mechanic will be in Fairbanks. Your LF will be your only radio guide across Canada. There is no Omni above the border.

From west to east, whether you pass customs at Lethbridge, Edmonton or Vancouver, you will fly into Fort St. John. From here you will follow the *Alaska Highway*, your guide and salvation in emergency for the next 2,000 miles. Weather and customs men are most courteous. No passport is necessary; when you leave Canada, be sure to check out with Canadian customs. Plan to arrive on American soil between 8:00 a.m. and 4:00 p.m. weekdays. A lone plane on Sunday can pay $33 to re-enter.

Clothes are no problem. In June and July you can fly 24 hours of daylight if you wish. I wore the same clothes in Fairbanks that I wore in Miami. Average temperature was 80 degrees. A warm sweater, flight jacket and raincoat are necessities for a rainy day.

Prices are high throughout the north. The Canadian dollar is worth more than American. For a ten-dollar Express check, you get $9.50 in exchange. Credit cards are accepted in all ports; carry Gulf, Standard and Shell. Gas prices vary but in Canada you get Imperial gallons.

Carry a light, efficient sleeping bag for each person. Also emergency rations in good supply. You may need them for plain reasons, not emergency in the wilderness. For example, Fort St. John has no rooms at the airport; the coffee shop is open only when airline passengers are coming through. Since oil was discovered near St. John, construction workers have taken all available rooms. You may call the Ford Hotel and hope for a nice room at $6; taxi fare is $2.50 each way. Otherwise, use your rations and spread sleeping bags on the terminal floor.

Fort Nelson; no rooms or food at airport. Gas and oil.

Watson Lake; not even a candy bar available; distance to town is 11 miles. Good service with gas and oil.

Whitehorse, capital of Yukon Territory, is a lovely town with good hotels and motels, offers a fair chance of accommodations.

Northway, Alaska, where you will land for US Customs has a grocery store but no hotel.

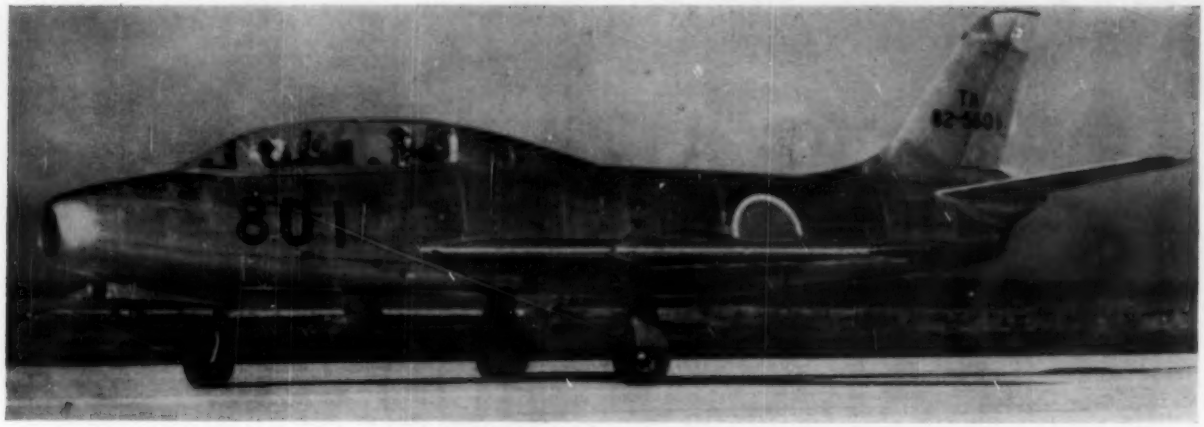
Big Delta; a huge installation on the highway is just 100 miles from Fairbanks where you will find every luxury at The International Airport, except rooms. Fairbanks will bulge with tourists!

Canada requires all private, single-engine aircraft to follow the Alaskan Highway. It is good sense, even although you are at times many miles off airways. Airways cover some very rugged country. Your magnetic compass is erratic; for hours you may not hear one good radio signal; keep that highway in sight at all times and feel better.

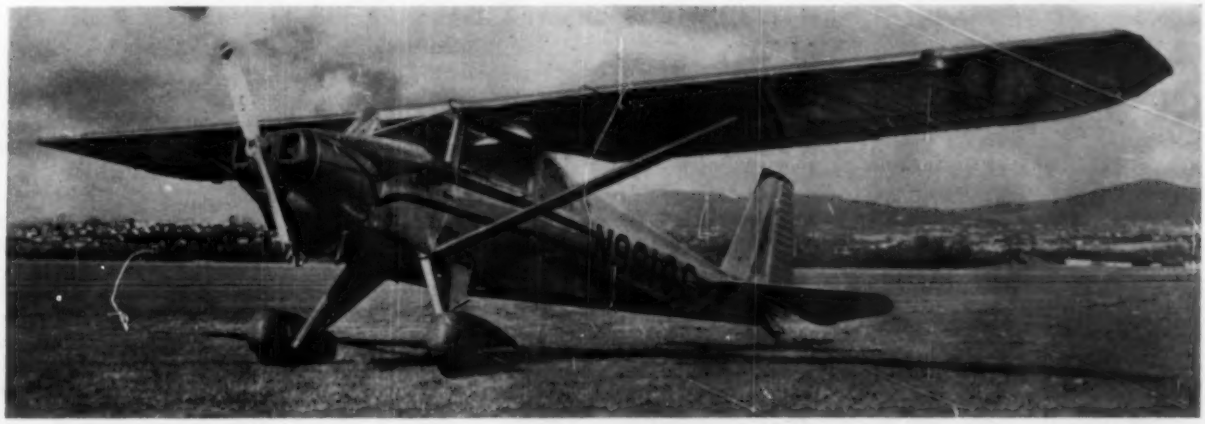
If you must see Juneau, the Capital of Alaska, hire a boat! You can fly from Whitehorse to Skagway, in good weather, by following the White Pass and Yukon Railroad at 11,000. Skagway has a good gravel strip and gas and oil. You can walk to town.

Fly a few minutes more across (*Continued on page 66*)

Have you seen?

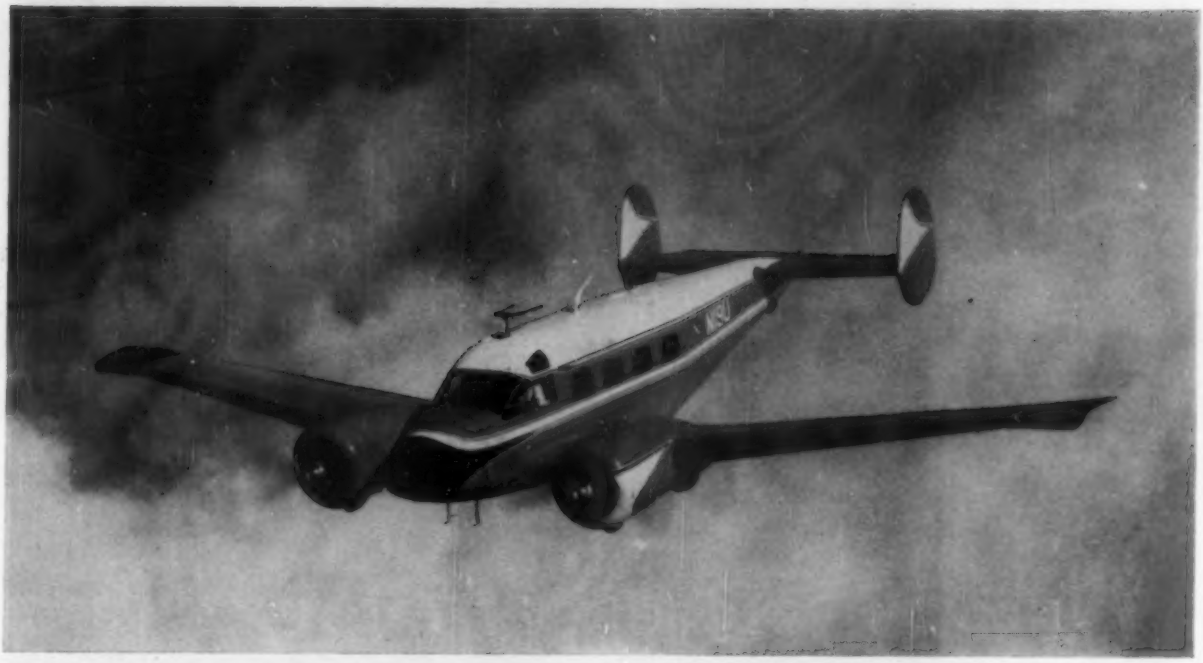


JAPANESE JET Two-place jet trainer designed and manufactured by the Fuji Heavy Industries of Japan. The aircraft is intended to replace the North American T-6 trainer now in use by the Japanese Air Force and was originally powered by a Japanese-designed jet engine. Due to delays in its manufacture, the prototype has been equipped with the British-built Bristol Orpheus of 3,285 pounds of thrust. On the initial flight test the T1F-2 became airborne in 880 feet. Span 34 ft. 6 in. Top speed 500 mph.

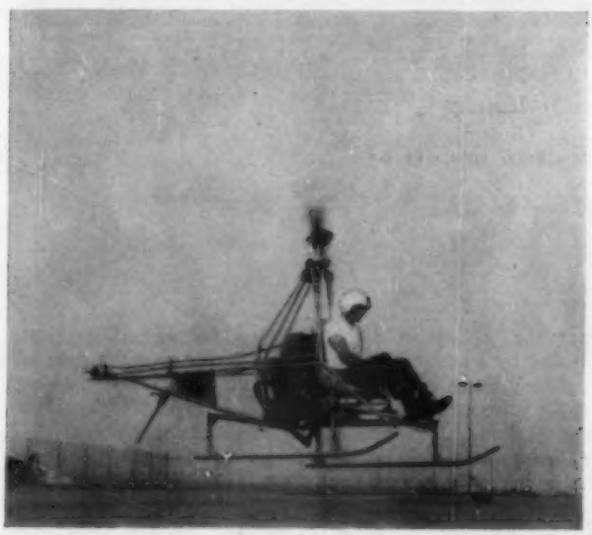


SILVAIRE LUSCOMBE Above: After an absence of 13 years, the popular two-place all metal lightplane is back in production manufactured by Silvaire Aircraft Co., Fort Collins, Colo. Powered by a 90-hp Continental engine, it has a cruising speed of 120 mph and a stalling speed with flaps, which are optional, of 40 mph. Without flaps, the ship stalls out at 48 mph. Range is 500 miles and fuel consumption five gallons per hour. Standard equipment includes dual controls and wheel pants.

TWIN TURBOCOPTER Below: Vertol 107 commercial twin turbine helicopter demonstrates its amphibious capabilities. Especially suited for intercity airline travel, it has a capacity of 24 passengers. Copter has sealed fuselage and main undercarriage fairings which obviates the need for flotation gear and gives good water stability. Prototype, shown here, is powered by two Lycoming T-53 turbine engines of 1,700 shp each. Production models will have G.E. T-58s rated at 2,100 shp each.



SUPER 18 FOR 1959 Though not evident, with the exception of the paint job, the 1959 model of Beechcraft Super 18 features a number of changes. Available this year is a choice of either the regular Hamilton Standard two-bladed propellers or new lightweight three-bladed ones, designed especially for 450-hp Pratt & Whitney engines, which permit a substantial increase in the plane's gross weight. In addition, there is a completely new interior styling with a wide choice of seating capacity up to eight passengers and selection of radio and radar installations. With its all-weather capabilities, short take-off and high cruising speed, the Super 18 is one of the most popular medium size twins used for business transportation.



HOBBY-COPTER Left: An ultralight one-man helicopter designed and built by Adams-Wilson Helicopters, Inc., Lakewood, Calif. Craft is powered by a 40-hp British Triumph motorcycle engine and is a helicopter in the true sense of the word. Over four years have gone into its design and it is now being marketed in kit form. The Hobby-Copter has a gross weight of 550 pounds, a rotor diameter of 21 ft. 6 in. and an estimated top speed of 60 mph. Range is around 120 miles.

MAYFLOWER II Right: New commercial non-rigid airship slated to go into service at Miami, Fla., as replacement for the one now in operation there. Capacity is 132,500 cubic feet of helium contained in a Dacron envelope. Length is 150 feet, diameter 41 feet and height 52 feet. The blimp has a top speed of 61 mph, cruises at 46 mph. It is equipped with a 28-volt electrical system to operate sign seen on envelope.

THE SEAGULL DOGS IT

His superb form is the embodiment of flight and, though he excels in the art of soaring, aerobatics are foreign to him.

By RICHARD D. BACH

I'VE ALWAYS ENVIED the seagull. He seems so free and uninhibited in his flying. In contrast with him I fuss and figure and clutter up the sky with noise just to stay in the air. He's the artist. I'm the tyro.

Lately, though, I've begun to wonder about the gull. Although he zooms and dives and turns with a grace that leaves me green-eyed, that's all he does—zoom and dive and turn. No aerobatics! Either he lacks initiative or he's faint hearted. Neither of these conditions is becoming to a top hand in the air. I don't want to be hard on him—don't expect eight-point rolls and clover-leafs initially but it doesn't seem too much to ask for a simple loop or an easy slow roll.

Many times as a confirmed gull watcher, I've been sure some young ace was going to show me something. He'd come screaming down toward the water, building up speed enough to satisfy any pilot and pull up . . . up . . . up . . . till I would be sure he was going over the top. I'd stand there muttering, "Pull it in!" but something always seemed to happen. You could see him slackening off the Gs and the pull-up arc would widen. He would roll out and lose himself in the crowd of his fellows as if thoroughly ashamed that he had dogged it.

"You look so lordly," I think, "but put a sparrow on your tail and I'll bet you couldn't shake him."

Other birds have developed some precision flying and a few aerobatics. Geese sometimes fly a passable formation, and that's worth mention. Some geese, though, evidently fear the mid-air collision. Many a formation has been spoiled by number Four or Five taking too much spacing and straggling all over the sky. Add to this the quacking of the others telling him to close it up, and it's just plain sloppy flying. No wonder hunters shoot them down.

The unlikely pelican is almost a candidate in the aerobatic field. He can execute a neat Split-S, but he doesn't meet a prime requirement of the maneuver; pulling out. He doesn't even seem to try to pull out, and ends in a geyser of white spray in the water. This isn't even playing the game.

So we come back to the seagull. We can excuse pelicans and geese, robins and wrens, but a seagull was plainly designed for aerobatics. Consider these qualifications:

1. Strong wings and spars, properly proportioned.
2. Slightly unstable design.
3. High limiting Mach.
4. Low stall speed.
5. Rugged construction.
6. Extreme maneuverability.

But all these factors are useless because he isn't aggressive in his flying. He's content to fly his life away practicing fundamentals that he learned during his first five hours in the air. So, although I do admire the seagull and the free way he flies, if I had to forego an aggressive spirit to trade places with him, I'd choose my noisy cockpit any day. END

ESSO

WING TIPS

IN-FLIGHT BOMBARDMENT. Before take-off, be sure to check cabin interior for loose articles such as earphones, flashlights, thermos jug, etc. Should gusty air conditions make the flight rough . . . these innocent looking objects can become flying missiles.

TAIL HEAVY. Ever try to take off with a couple of bags of cement on your tail? Well rain can cause you the same kind of trouble when it seeps in and collects at the tail-end of your fuselage. Wing Tip: when the weather's wet, check the fuselage inspection holes for signs of water and ice.

FUELS. Esso Aviation Gasolines are carefully balanced to give your engine the utmost in power and economy. Moreover, they have a reduced lead content – far less than the maximum allowed by government specifications – which means less spark plug fouling and fewer engine deposits, with increased life of engine parts. So next time – be sure you get the most from your engine, be sure you get Esso Aviation Gasoline!

REMEMBER For Happy Flying . . . look for the Esso Sign, trademark for 600 dependable Esso Aviation Dealers.

FLYING CHARGE ACCOUNT. Here's real convenience – get an Esso Aviation Credit Card from your Esso Aviation Dealer. When you land, your plane can be completely serviced without making any cash payment. With an Esso Credit Card, you can charge gasoline, oil, and lubricants *plus* tire and battery service, landing fees, overnight in-transit storage and minor repairs.

ESSO STANDARD OIL COMPANY

Highways or Skyways . . . ESSO RESEARCH works wonders with oil

NO. 234

I learned about flying from that!

Good flying procedures were forgotten when sudden mechanical difficulty developed on a first cross-country.

By EUGENE K. FRIEDMAN

ALTHOUGH AS A GEOLOGIST my main concern has been with the earth, I have often cast a wistful glance skyward. And so last summer, at the age of 30, I decided it was time to stop wishing and start flying. After convincing everyone at home that this was not a particularly dangerous undertaking, I enrolled in a flight school operating from Daugherty Field in Long Beach, Calif.

My training plane was a 1957 Champion, painted white with red trim, equipped with a VHF transmitter and receiver, in addition to the basic instruments.

I was anxious to learn and, weather permitting, flew every day. My flight training progressed normally; I soloed successfully when the time came and, in due course, logged enough time to take my first solo cross-country. It was on this flight that I made my first real crosswind landing, using the controls intuitively rather than by the numbers. I didn't realize it then, but subconsciously I began to believe that I could handle an emergency by intuitively doing the right thing.

After a few more hours of solo practice my instructor scheduled Saturday August 24th for my first long solo cross-country. It was to be a five-hour flight to Blythe and return with a practice landing at Thermal along the way. Friday night friends came to visit, with the result that I stayed up late and had no opportunity to select check points or to plot my course. Early Saturday morning I drove down to the airport, feverishly plotted the trip, checked the weather, filed a flight plan, went through the line check, received take-off clearance and took off.

I climbed steadily through the hazy, smoggy morning, came out on top at about 4,000 feet and continued to 7,000 feet which was the plane's optimum cruising altitude. Here I stopped watching the compass and headed for Mount San Jacinto which reared up tall on the horizon, with its southern slope draped in dark stratus clouds. I droned on over my checkpoints: the Santa Ana River, Lake Matthews, and Banning, the city at the western entrance to San Gorgonio Pass. At this point navigation was easy, with the pass framed by 10,000-foot peaks. But something was wrong. Those stratus clouds on Mount San Jacinto began to blow over into the pass; dark streaks of rain could be seen beneath them. It was almost a quarter after twelve, so I tried to tune in to the weather report on Thermal Radio; but all that came out of the set was a crackle of static. A few large raindrops hit the windshield and a feeling of uneasiness crept over me. Setting my transmitter to 122.1, I called Thermal Radio three times in a row without result. As the weather ahead looked a little better, I decided to land at Thermal, as planned, and check the weather in person. Having made this decision, I relaxed a little and watched the oasis of Palm Springs appear under my right wingtip. I looked for the airport but couldn't be sure whether I actually saw it or not. Several minutes later, Cathedral City slipped by. Palm Desert Airport, which was just south of Cathedral City, was my next check point. I could not locate it but saw something that looked like a child's finger-painting, and the highway pattern fitted, so checked it off and began to look ahead for Thermal. My watch told me it was only five minutes away, I called Thermal Radio again but there was still no reply. Now Thermal Airport was in sight, so I reduced power and let down to 500 feet, being careful not to exceed 100 mph.

As the airport ahead was slightly to the left, I held my course until about 2,000 feet past the field and then banked left into the traffic pattern and banked left again. When I tried to roll out at the turn and pushed the stick to the right, it wouldn't go. In disbelief, I tried again but the same thing happened; meanwhile the plane skidded out of the turn slowly and sloppily under rudder alone. Although the stick could be centered easily enough, it would bind when shoved right and go past that point only under very heavy pressure, then it would bind again on the way back. I wanted to ask Thermal Radio for advice but knew it was no use, as radio contact could not be established just five minutes ago. I made another left bank following the airport boundary. It was the shallowest bank I could make and still get around. When I tried right stick at the conclusion of this turn, I could see the right aileron sticking. I came out of this turn sloppily, not willing to force the controls for fear that the cable would break. Suddenly, I realized how little I knew about airplanes; maybe the whole aileron was about to come off, or the stick about to freeze. Somehow I got around and lined up on the final approach. I was possessed with the idea of getting back on the ground and decided to stay down no matter what kind of an approach I made. I came in at about 75 mph, ten mph above the normal approach speed, thinking that the flare-out would slow the ship down. The runway was going by so fast it looked like a grinding wheel. When the plane touched down it veered left and I hit right rudder to correct, the left wing tip dipped toward the ground. I tried to apply right stick, but it was sticking. Then I made another mistake, I stayed with the stick and forgot about the rudder pedals. Immediately the plane started a ground-loop to the right. I came to and applied full left rudder but nothing happened because I had let the tail wheel lift off the ground by (*Continued on page* 90)

RAZOR-SHARP SELECTIVITY...

CONTROL UNIT FOR TYPE 210

...IS ONLY ONE HIGH PERFORMANCE FEATURE OF ARC's 360 CHANNEL TRANSMITTER-RECEIVER TYPE 210

CERTIFIED TO FAA'S TSO C-37 AND C-38 CATEGORY A

Clear, positive channel tuning without adjacent channel interference is only one of many features that distinguish this quality-built instrument. Full 360-channel transmission and reception is another. No need to add more later. 15 watts of power mean optimum distance range when needed.

As in all ARC equipment, there is an extra margin of stability and tested-and-proved reliability. Not just while the Type 210 is new will it deliver peak performance. It will remain dependable in every function after years of continuous service — and under extreme operational and environmental conditions.

This is the extra margin of quality that makes ARC equipment out-perform and out-last others. Ask your ARC dealer.

Aircraft Radio Corporation

BOONTON, NEW JERSEY

Dependable Airborne Electronic Equipment Since 1928

OMNI LOC RECEIVERS • COURSE DIRECTORS • AUTOMATIC DIRECTION FINDERS • 360 CHANNEL VHF TRANSMITTER-RECEIVERS • GLIDE SLOPE RECEIVERS OMNIRANGE SIGNAL GENERATORS AND STANDARD COURSE CHECKERS • 900-2100 MC SIGNAL GENERATORS • 10-CHANNEL ISOLATION AMPLIFIERS UHF AND VHF RECEIVERS AND TRANSMITTERS (5 to 360 CHANNELS) • MARKER BEACON RECEIVERS • INTERPHONE AMPLIFIERS • CABIN AUDIO AMPLIFIERS

Canada's Fly-in Fishing

(Continued from page 36)

one-third of what it would have cost only a few years ago. For $100, three men and their gear can be set down on an isolated lake for almost any kind of fishing they may specify. The price can range up or down from that figure, depending on the fisherman's wants. If one doesn't want to outfit himself, he can rent a sleeping bag for $1 a day, or a tent for $1.50. A canoe or boat runs from $2.50 to $5 a day, depending on how deep in the bush is the location. A complete cooking kit rents for $5 per trip. Guides run from $12 to $15 a day, sometimes with and sometimes without canoe and motor. Your flying outfitter will even buy your food and remember to include insect repellent or landing nets you may have forgotten.

"If a man phones us first, we can have him on his way with everything he needs within 15 minutes after he reaches here," one flying outfitter, Earl Robert Dale, of Airdale Flying Service, Sault Ste. Marie, Ontario, told me recently.

The variety of fishing available on these fly-in trips to the deep bush is fantastic. One may specify speckled trout, lake trout, rainbows, northern pike, or walleyes, or a combination of them. Some lakes have both big square-tails and lakers; others have pike and lakers; or walleyes and pike.

About half the outpost camps in the eastern half of Canada are fully founded, with operators, cabins, guides, boats, motors, and a dining room. About one-fourth are untended camps consisting of a small cabin and boat on a lake that can be reached quickly by air. The other fourth are tent sites, with a boat or canoe available. Flying time ranges from 15 minutes to two hours. A radio network covering planes and scattered bases provides up-to-the-minute weather reports for safe flying.

The fisherman can rough it just as hard as he wants on an outpost fishing trip, for one day or one month; or he can keep his feet dry from start to finish. The ladies love it. It's not so easy to leave your wife behind when she learns that you are roughing it on the soft pastel plastic upholstery of a Cessna 180 all the way. Most flying outfitters work within a radius of 100 miles from base, occasionally stretching it to double and sometimes triple that distance, if there's an exceptional fishing reason for it. Covering the eastern half of Canada are Severn Enterprises out of Sioux Lookout; Superior Airways out of Fort William and Pays Plat; White River Flying Service out of White River; Airdale Flying Service out of Sault Ste. Marie; Northland Air Lines out of Timmins; and Austin Airways out of Sudbury; all in Ontario; Wheeler Airlines operates out of Montreal and Ste. Jovite, Quebec; and Northern Wings out of Seven Islands, Quebec. A phone call or letter to any of them can set up a personal fishing trip that will never be forgotten.

I was in Sioux Lookout, Ontario, last summer investigating a rumor of good fishing when I was offered this chance to try an outpost trip by Randy MacDonald of Severn Enterprises, and Harry Johns of Minnetaki Lake Lodge. For several years, in addition to Minnetaki Lodge, Harry has also operated a two-cabin outpost camp on the Chamberlain Narrows of Lac Seul, about 75 water miles north of Minnetaki. Now he had just opened up a tent outpost camp on Lake Bamaji, another 100 canoe miles north of the Chamberlain Narrows Camp.

"It's a fantastic place," he said in his careful, clipped speech. "There's this little cove at the far northeast end of Bamaji. On one side of the cove, a river tumbles down from Fry Lake into Bamaji across a shallow rapids. The river makes a current in the cove, and the walleyes, and northerns are in there thick as flies. The fishing is incredible."

"Forty minutes by air," Randy added. "Want to try it?"

At that moment Glenn and Nelle Epple drove in from Chicago. Glenn runs a dental laboratory and Nelle is an English instructor in the Chicago Public School system. They were tired from the long drive but not too tired to talk fishing. Within five minutes we had the trip lined up for the four of us. Two days later, at 8:15 a.m., Randy gunned the motor in a four-place Cessna 180 floatplane and we took off for Bamaji. The distance was 75 miles by air. We set our floats down at the entrance to the cove and taxied to a landing stage where we tied up the plane and launched a fibreglas boat that Harry Johns kept waiting at the dock. Above us on the hill was a weatherbeaten two-story house which at one time had been used as a line camp by the Ontario Hydro Electric Commission, whose power line ran through here from Red Lake to the gold mining town of Pickle Crow. The camp was abandoned when the Commission began using helicopters, instead of men on foot, to search for line breaks. Randy walked up the hill and came back with a five-hp outboard and an armload of seat cushions.

The cove was about 400 yards long and 100 yards wide. We anchored in the current where Fry Lake River splashed into the cove over a bed of gravel and rocks. I looked at my watch when I landed that first walleye. It was 9:15 a.m., exactly one hour since leaving Sioux Lookout.

My second fish, after considerably more of a struggle turned out to be a 12-pound great northern pike. Then Glenn and Nelle began boating walleyes on almost every cast. The stringer filled up rapidly. We had to take turns fishing. The strikes came too fast to have more than one line in the water at a time. During one of my idle periods I saw a canoe carrying two men round a point of land and glide into the cove. I hailed the canoe and asked if I could come aboard. Quick introductions identified the two strangers as mineral prospectors working out of Toronto—Don Brown of South Porcupine, Ontario, and Bob Roberts of The Pas, Manitoba. They had just come from Bend Lake to prospect Bamaji for gold, uranium and iron, and for the present had unrolled their sleeping bags in the abandoned line camp on the hill.

These are the kind of fellows who are opening up new fishing bonanzas all over northern Canada. They're covering the ground foot by foot searching for ore, but at the same time they are fishing for food in the thousands of unexplored lakes and rivers throughout the bush country. They said they had been in places where the fish simply took their lures away from them as fast as they dropped them into the water. Now, in mid-summer, they were down to one battered old spoon they were hoarding as if it were made of pure gold. They had no intention of letting that last spoon get into any water where they couldn't see the size of the fish that might reach for it!

Glenn and I dug into our tackle boxes and offered them new spoons and lures of various kinds. They accepted a half dozen and invited us to use their kitchen for lunch. Back on the dock, Glenn and Randy boned out a half dozen of the smaller walleyes. The prospectors were finished with their lunch by that time and Glenn took over on the kitchen's two-burner stove. He turned out to be a jewel of a cook. I took a platter of walleye fillets and a pint-sized mug of tea outside and ate there in the warm northern sunshine until I thought I'd burst.

That lunch had lightened our stringer considerably so we went back to fill it up again. But by now the walleyes were skittish. We had to work for them. The afternoon passed quickly. We must have tossed back a dozen northerns and as many small walleyes before we had our limit of six big walleyes each. By then it was 4:00 p.m., and time to go. On the way back Randy climbed to 2,000 feet above Bamaji so we could take a look. The westering sun turned the lake to silver, with dozens of islands and long points standing out in black. "This lake is 17 miles long. In the Ojibway language, Bamaji means 'crossways'. The whole lake lies exactly cross-current to the Cat River system. It's full of fish. All those islands, all those points, that deep water, and those currents—"

"When did you say those trout come up again?" Glenn asked from the back seat.

"Late September."

"We're coming back in September," Glenn said. "We're going to camp up there on that hill for a week, and fish those points and those islands—brother, what a paradise." END

NEXT MONTH

IN FLYING

OF MEN AND PLANES

Donald W. Douglas recalls in his memoirs the beginning of the famous DC series airliners.

The B&H JETCAL® ANALYZER

now safeguards passenger jets

assures... maximum range
lower operating costs
increased safety
peace of mind... for crew and passengers!

TESTS EGT SYSTEM ACCURACY to ±4°C (functionally, without running the engines).

RUNS TEMPERATURE SPREAD CHECK on TWO ENGINES at SAME TIME. CUTS TEST TIME 50%.

TESTS RPM ACCURACY to 10 RPM in 10,000 RPM (±0.1%).

CHECKS HEAT, ANTI-ICE and FIRE DETECTION SYSTEMS.

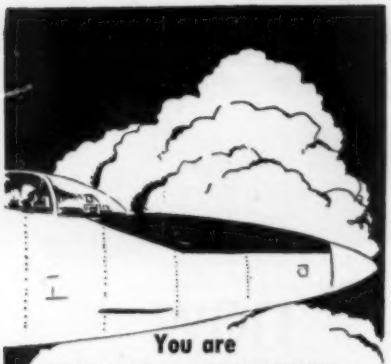
The JETCAL® is in worldwide use... by the U.S. Air Force and U.S. Navy as well as by major aircraft and engine manufacturers... and air lines. *Write, wire or phone (EDison 6-7243) for complete information.*

B & H INSTRUMENT CO., INC.

3479 West Vickery Blvd. • Fort Worth 7, Texas

SALES-ENGINEERING OFFICES:

COMPTON, CALIF.: 105 North Bradfield Avenue • NE 6-8970
VALLEY STREAM, L. I., N. Y.: 108 South Franklin Avenue • LO 1-9220
DAYTON, OHIO: 5606 Rice Place • BE 3-4411
CANADA: GEORGE KELK, LTD., 131 Willowdale Avenue, Toronto, Ontario
ENGLAND: BRYANS AEROQUIPMENT LIMITED, 15, Willow Lane, Mitcham Surrey *Exclusive Licensee and Manufacturer for Great Britain, British Commonwealth and Europe*



You are

TOPS in AVIATION

when you get your EDUCATION at

PARKS

COLLEGE OF SAINT LOUIS UNIVERSITY

There's a future waiting for you when you choose Aviation as a career . . . and being a PARKSMAN adds to your prestige.

PARKS offers to you the advantage of a Bachelor of Science degree in 3 years instead of 4 . . . and there is no elimination of subjects. Classes are held for 45 weeks out of the year. Such an accelerated program permits PARKSMEN to start their careers nearly 1 year sooner.

You may earn a B.S. Degree in:
Aeronautical Engineering
You may earn a B.S. Degree in Aeronautics
Aeronautical Administration
Aeronautical Meteorology
Aircraft Maintenance Engineering

(Air Force ROTC allows you to complete your education without interruption.)

Non-degree courses available — CAA Approved, A & E Mechanics — 45 weeks covering all phases of aircraft and engines.

Flight courses—Private, Commercial, Instrument, Instructor and Multi-engine Ratings.

All Parks Schooling is Approved for Veterans. Remember too, the PARKS faculty combines the talents of men holding advanced academic degrees as well as experts from the aviation industry.

PARKS offers only the most superior training and because this is a fact . . . enjoys an enviable reputation around the world!

31 YEARS OF AVIATION EDUCATION

GET THIS BOOK

Page after page of pictures describe how PARKS students live and learn.

MAIL THE COUPON NOW!

PARKS COLLEGE, HARPER HALL
East St. Louis, Ill., Dept. 3089
Please send View Book

I am interested in:
- ☐ Aeronautical Administration
- ☐ Aeronautical Engineering
- ☐ Aircraft Maintenance Engineering
- ☐ Aeronautical Meteorology
- ☐ Flight Course
- ☐ A & E Course
- ☐ G.I. Training Information

Name.....Age.....

Address.....Zone.....

City.....State.....

Emergency Procedures

(Continued from page 35)

characteristics. Some types have floated for days, others for hours, still others for only a few seconds before sinking. What the jets would do is hard to predict. Let us hope we never have occasion to find out.

All civil aircraft on overwater flights must carry life jackets for passengers and crew, as well as life rafts and survival equipment. Life raft design has enormously improved during the past few years. Latest versions weigh about 128 pounds and are capable of carrying 25 persons. They are stowed folded in the ceiling of the cabin adjacent to the regular exits.

When a landing on water has been made successfully, all passengers, wearing life jackets uninflated until they are outside the aircraft, leave through the emergency exits. The crew releases the life rafts and throws them overboard. A sharp pull on a nylon cord inflates each raft in ten seconds from two compressed air bottles. Attached to each raft is a bag containing survival equipment such as rations, first aid kit, fishing gear, harpoon, signal mirror, shark repellent, dye marker, desalting kit and even a Bible, all duly waterproofed. Latest model rafts even have lightweight poles to rig a nylon sun and rain cover. People have survived in such rafts much less amply equipped for weeks.

Fire is an ugly word, especially on board an airplane. Fire fighting assumes an important part of any aircraft's emergency outlay and of the crew's training. Combating engine fires in jets is simpler than for piston-powered aircraft, because there is no need first to stop the engine by feathering its propeller. Visual indication of engine fire is shown by a steady red light in a transparent control handle in the cockpit, one for each engine. Overheat conditions are apparent by a blinking light. Fire control is simplicity itself. When a red light appears, pull the corresponding control handle full out. This stops the flow of fuel to the engine and normally should extinguish the fire. In case fire continues, an extinguishing switch is actuated, discharging the contents of one or several bottles of fire extinguishing bromo-tri-fluormethane into the engine. If this should prove still ineffective, the engine and pod are supposed

(Continued on page 62)

NOTHING TO IT

When there are bigger and better oceans to be flown in business aircraft, we know two ladies who will be happy to accommodate. Leaving Oklahoma City for the Paris Air Show, Miss Jerrie Cobb in an Aero Commander 680-E, paused in New York to pick up her friend, Cecile Hamilton, Managing Editor of FLYING, and away they went, via Boston, Torbay, the Azores and Lisbon to France.

"We're going to fly this crossing at our own sweet pace and are out to prove nothing except that there's nothing to it that a good airplane and a couple of Paris-minded girls can't handle."

Supplemented our Miss Hamilton, "My part in this project is probably the toughest of all—catching up on use of those pesky irregular French verbs so we can talk our way down when we get there—and there's shopping to be done!"

Actually we doubt that either young lady will have much difficulty around the Place Vendome. Both are "old Paris hands." Miss Hamilton originally trained as a pilot in Europe and was the first American girl to have a British license while Miss Cobb has ferried the north Atlantic on numerous occasions and is well aware of where the pretty dresses originate—at home or abroad.

From reports received as we go to press, the only difficulty encountered en route was inability to get a hotel room for an overnight stop in Lisbon. Princess Margaret of Great Britain had also made landfall in the Portuguese capital and the city was full up with the social whirl. Our representatives of the weaker sex flew down the coast to a resort town and parked for the night.

What a world! We remember when two young ladies from an Ohio valley town drove an automobile some 500 miles to New York and made headlines—less than 40 years ago!

Cecile Hamilton (left) and Jerrie Cobb

PLANE FAX

by STANDARD OIL COMPANY OF CALIFORNIA

Flying Life-or-Death Missions in the High Sierra

When ambulance sirens whine in the lumber town of Chester, Calif., that's the signal for Harold E. Rogers to warm up his Cessna 170. For flying is the only quick way to get emergency cases to full hospital facilities beyond the mile-high peaks that surround this Sierra town. In many cases, Rogers' flight has been the difference between life and death for seriously injured patients.

"In this kind of country, there are no emergency landings," says Mr. Rogers. "You've got to be sure of your plane and your fuel. That's why I use Chevron Aviation Gasoline. It gives me dependable emergency power... power to climb up and over some of the toughest mountain ranges in the West.

"And here's another thing that's important to me. RPM Aviation Oil Compounded is the only oil I've found that really licks the old bugaboo of cam lobe wear. It keeps them lubricated even in the toughest flying conditions. Moreover, the last time our Cessna 170 got its 800-hour overhaul, I found the rings still had the original machine marks. The engine was so clean it was a shame to tear it down."

TIP OF THE MONTH

When flying in mountainous country, Mr. Rogers suggests you follow the ridgeline. This allows you to head for a valley on either side in case of trouble.

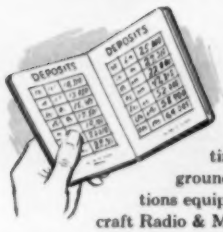
We take better care of your plane

CHEVRON AVIATION FUELS

AVIATION OILS RPM

T.M.'s "RPM," "Chevron," "Plane Fax," Reg. U.S. Pat. Off.

PUT Money in the bank!



You put money *back* into the bank every time you buy aircraft and ground station communications equipment from Florida Aircraft Radio & Marine, Inc.

You don't just buy new radio equipment or new and used surplus equipment . . . *always available* is an inventory of spare parts valued at well over a million dollars, *kept up-to-date* in a 40,000 sq. ft. building adjacent to the Miami International Airport.

You save money because the cost is less than the original manufacturer's price, and because you have the confidence that the equipment can be supplied, if necessary, by the required spare parts for the next 5 to 10 years! Export-Import Permit #3108.

A.R.M. SERVICE CORPORATION

Skilled technicians — supplied with the very best of test equipment — completely "tear down" and re-build your units, whether one or a dozen. Each specializes in OMNI, A.D.F., V.H.F., H.F. A.R.M. is FAA (CAA) Approved Repair Station #3653.

FLORIDA AIRCRAFT RADIO & MARINE, INC.

W. C. ROGERS, PRESIDENT

MAILING ADDRESS: 5365 N. W. 36th Street, Miami Springs, Florida, U. S. A.
CABLE ADDRESS: AIRADIOMAR • Desk-Fax BDT • Tel: TUxedo 8-4614, 8-4615

DISTRIBUTORS FOR: Aircraft Radio Corp. • Bussman Fuses • Tung-Sol • Dayton Aircraft Products • Johnson Insulator • American Lava • Erie Resistor • Sprague Condenser • Fed T & T • National • Amperex • EIMAC Plastoid Corp. (wire) • American Pamcor Corp. • General Electric (tubes) • Tempo (paints)

OUR RECOMMENDATIONS ARE OUR ACCOUNTS WHICH ARE WORLD-WIDE

WE CAN COMPLETELY SERVICE YOUR ACCOUNT
in all respects, eliminating brokers, packers and forwarders

HIGHEST CASH PRICES PAID!

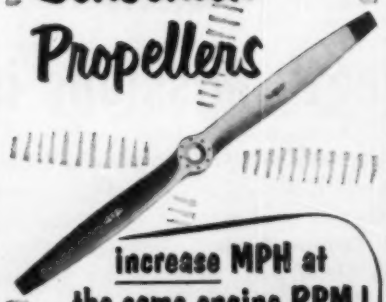
TWINS and clean SINGLE ENGINE AIRCRAFT **WANTED**

MOhawk 4-6260

GRAUBART AVIATION INC.

PRUDENTIAL PLAZA CHICAGO 1, ILL.

Sensenich Propellers



increase MPH at the same engine RPM!

You can get up to a 10% increase in propeller efficiency by selecting the new Sensenich . . .

FIXED PITCH METAL
CAA approved up to 165 hp
Also available from Sensenich . . .
FIXED PITCH WOOD
CAA approved up to 225 hp
TEST CLUBS
up to 3000 hp
Write, wire or phone today for Bulletins and Price Lists.

Dept. Y, Sensenich Corp., Lancaster, Penna.
Sensenich PROP SHOP . . . Certified Repair Station for all makes fixed pitch metal or wood propellers . . . Sensenich, Beech and Hartzell controllables. Magnaflux, etching, anodizing and plating service available. Service Hangar on Lancaster Municipal Airport. Approved Propeller Repair Station 3528. Unlimited Class 1 and 2 ratings. Distributor of Hartzell propellers and parts.

(Continued from page 60)

to drop off altogether—one of the strong points in favor of engine pod construction in contrast to built-in engines in the wing structure.

Cabin and airfoil heaters present no fire problem in jets because the required heat is derived from hot air taken from the compressor section of one or more of the engines. Heretofore these heaters were of the gasoline combustion type and each required its own individual carbon-dioxide and fire combating procedure by the crew. For local fires inside the cabin, extinguishers, carbon-dioxide and water are provided at various places in the cabin and cockpit.

Fuel dumping, the release of fuel in flight to reduce the weight of the aircraft, is not strictly an emergency measure. It is done as a matter of routine any time a transport is forced to land before it has burned sufficient fuel to bring its weight down to the maximum landing weight for that particular type of airplane. However, fuel dumping can be part of various emergencies such as loss of power, gear-up landing, water landing, etc. It is thus incorporated in the emergency check lists and emergency training for air crews.

The maximum landing weight of a certain airplane may be thought of as that weight over and above which only disposable fuel may be added up to maximum take-off gross weight. The spread between these two figures has been getting steadily larger with increasing size of commercial aircraft. For instance, after a maximum gross weight take-off, a Douglas DC-6B requires seven minutes of fuel dumping to bring its weight down to permissible landing weight. Its larger sister ship, the DC-7C requires 18½ minutes for this operation.

Jets gulp fuel at a prodigious rate as compared to their piston counterparts and dumping flow rates must be increased proportionately. The pilot of a Boeing turbojet after a full gross take-off, if forced to land immediately afterwards, must scavenge about 12,000 gallons of fuel in the atmosphere, taking 29 minutes to release, before he may legally bring his ship back to the airfield. Such unscheduled landings can be costly indeed.

Though by itself a simple operation, fuel dumping can be dangerous, as many unfortunate incidents in the past have disastrously demonstrated. An airplane, for instance, which while jettisoning fuel flies in circles, could fly right into the explosive mixture of its own fuel trail. Sparking electrical relays could set fire to fumes entering the aircraft structure such as the wheel wells. However, when adhering to approved procedure, fuel dumping is now completely safe and any pilot electing to land his plane over the landing gross weight must file a report with the civil aviation authorities giving reasons why he considers his action safer than first getting rid of his excess weight.

Once in the wallet of an aircrash victim was found an unsigned application for life insurance which would have meant financial security for his family. Emergency gear on aircraft is like life insurance. We never really expect to need it—but if we do, it had better be there. END

"Thanks for inviting me to fly the Twin-Bonanza. I had no idea what I've been missing!"

Executive Pilots:

Fly it and see why it's America's most popular 5-to-7 place business plane

Is your company outgrowing a 4-place airplane? Or thinking of buying another 5-to-7 place plane? As your company's pilot you will be expected to advise your firm wisely in its choice of the best airplane to fit its needs. That's why, if you haven't yet flown the new 1959 Twin-Bonanza, now is a good time to do so.

The place to do it is at your Beechcraft distributor's or dealer's, where there's a special invitation for you to come take a demonstration flight.

Here are just a few reasons why the Twin-Bonanza is today's most popular 5-to-7 place executive twin:

1. Supercharged fuel injection Lycoming engines let you cruise far above mountains and weather. Service ceiling, 28,300 ft.

2. Total of 680 takeoff horsepower lets you clear a 50-ft. obstacle in less than 1,300 feet, fully loaded.

3. Cruises faster—228 mph at only 70% power.

4. Longer range—up to 1800 miles non-stop.

5. By far the strongest, most rugged commercial airplane in its class—designed and tested for 7G load factor.

6. Choice of 6 seating plans for 4 to 7 persons.

7. Complete operating, maintenance and depreciation costs as low as 22¢ per plane mile—less than 4¢ per seat mile.

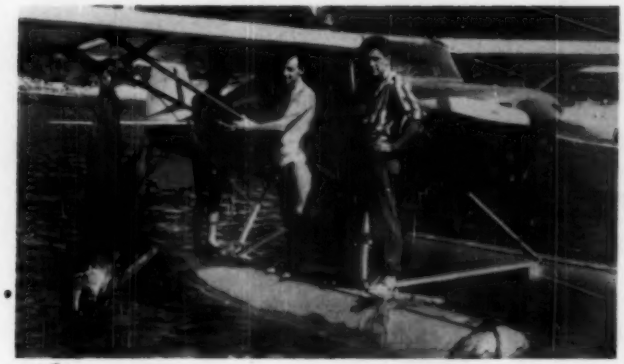
But there's more, much more, waiting for you to discover at the controls of the Twin-Bonanza. See your Beechcraft distributor or dealer soon. Be sure to ask about low-cost Beech financing and leasing plans. Or write to Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR MS 760 JET

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

for fun and freedom . . .



Fly Floats

IF YOU LOVE hunting, fishing, or just getting off the beaten track, an Edo-equipped seaplane is perfect for you.

Every lake, river, cove and harbor provides a nature-made runway . . . precisely where you want to go.

For fun . . . for convenience . . . for complete freedom—FLY FLOATS.

Why not visit your airplane dealer soon and learn how pleasant and useful your own seaplane could be? Edo floats are easily installed on the Cessna 170, 175, 180, Piper Tri-Pacer, Super Cub and many other types as well. For full facts, write for "How To Fly Floats" booklet, complete with photos and diagrams.

Edo SINCE 1925

EDO CORPORATION
College Point, Long Island, New York

Call-Collect

WE BUY AIRPLANES

CASH NOT CONVERSATION

Twins-For—Single Engine

VEST AIRCRAFT CO.
EM 6-2663 Denver 17, Colo.

Send FLYING Every Month

name _____

address _____

city _____ zone ___ state _____

Check one: ☐ 3 years for **$12**
☐ 2 years for **$ 9**
☐ 1 year for **$ 5**

In the U. S., its possessions and Canada

Foreign rates: Pan American Union countries, add 50¢ per year; all other foreign countries, add $1.00 per year.

Mail to: FLYING, Dept. F-8-9
434 S. WABASH AVE., CHICAGO 5, ILL.

Little Planes—Big Business

(Continued from page 47)

months; averaging 1,000 pounds of meat a week. Shortly thereafter, the Sedan was replaced by a Cessna 180 which type has been gaining tremendous popularity in all phases of northern bush-flying. Most major commercial outfits use them, as does the Warden Service and Maine Forest Service. The Fish and Game Department has no less than four.

The two periods which have always plagued Northern bush-pilots are early spring and late fall, when the lakes are ice-sheathed, thus ruling out floats, but when the ice is unsafe for skis. IPC solved this by carving out several air-strips. The main strip is at the "Depot" camp; just inside the Maine border from St. Aurelie. The strip is 1,600 feet long, and is provided with a gas pump and a three-plane hangar. The hangar has proved especially valuable in the winter. Keeping the planes under cover eliminates the time-consuming drudgery of ridding them of ice and snow. Another strip is located at the Clayton Lake camp, and is also provided with a gas pump, as is the Company's Clayton Lake seaplane base.

A practically ready-made landing strip was discovered a short distance from one of the Company's main hauling roads. It is a natural, 1,600-foot gravel bar on the bank of the St. John river. The only "carving" necessary for this strip consisted of bulldozing the surface. Due to its deep gravel bed and excellent drainage, the strip is invaluable in the spring. It can be used as soon as the snow leaves, while the other strips are still too wet.

Today, the IPC plane averages 350 hours annually; a substantial increase over the 200 hours of 1946. The full import of the increased air-work is not realized, however, until a comparison is made between the original Cub and the present-day 180. Besides boosting the cruising speed by more than half, the 180 also increased the payload four times. These figures do not include the 200-odd annual hours of Company business run up in Mr. Blaisdell Jr.'s personal Super-Cub.

One of the most important improvements in the Woodland Department's admittedly complicated communications problem came about a few years ago when the Department was assigned to Two-Way radio frequency. Today, the Company operates its own communications system, comprised of 13 Two-Way units. Of these, one set is installed in each of the two aircraft; one each at the two main supply bases at Clayton Lake and St. Aurelie; three mobile units in pick-up trucks; one handy-talky for use in fire emergencies; and five are at temporary outlying camps. In addition, the Division has installed a unit on its frequency in the Hardwood Mountain Lookout Tower, thus providing a tie-in with the Maine Forest Service facilities.

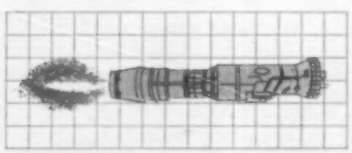
This illustrates the co-operation which is maintained between the landowners and the Maine Forest Service. Forest fires are, of course, of vital concern to all parties and top priority is given to forest fire suppression for the use of all Company

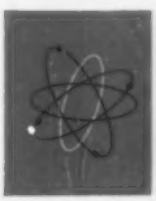
(Continued on page 66)

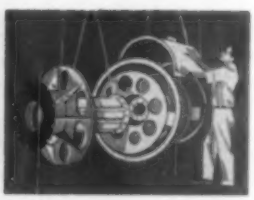
DANGER
LIVE ENGINE

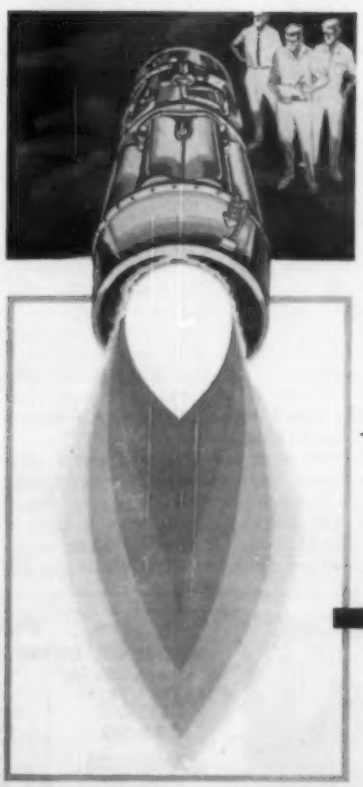
. . . THERE'S PURE ADVENTURE AHEAD FOR YOU AT SPARTAN. STUDENTS LEARN ON LIVE ENGINES. YOU LEARN ENGINE MAINTENANCE BY WORKING ON THEM . . . WHETHER IT'S THE EXTENSIVE COURSE . . FOR RECIPROCATING ENGINES OR THE ADVANCED COURSE FOR JETS. LIVE ENGINES ARE DISASSEMBLED, REASSEMBLED AND TESTED . . . AN INTEGRAL PART OF THE AIRLINE MAINTENANCE COURSES. YES, . . . SPARTAN TRAINS YOU THE RIGHT WAY . . . GIVES YOU THE TECHNICAL KNOW-HOW YOU MUST HAVE TO SUCCEED IN TODAY'S JET AGE.

WRITE SPARTAN FOR FULL INFORMATION . . . TODAY!









Spartan is approved for training under G.I. Bill of Rights

INDICATE WHICH OF THESE BRANCHES INTERESTS YOU

- JET ENGINE MECHANIC ☐
- AIRCRAFT & ENGINE MECHANICS ☐
- CO-PILOT, ENGINEER ☐
- COMMERCIAL PILOT ☐
- PILOT INSTRUMENT RATING ☐
- LINK TRAINER INSTRUCTOR ☐
- INSTRUMENT TECHNICIAN (STANDARD AND ELECTRICAL) ☐

CLINTON E. WILKERSON / Director of Admissions
Spartan School of Aeronautics
Dept. F-859 / Municipal Airport / Tulsa, Oklahoma

Please send complete information immediately.

NAME_____ AGE_____

ADDRESS_____

CITY_____ STATE_____

SPARTAN SCHOOL OF AERONAUTICS / municipal airport / tulsa, oklahoma

On Course the Kane Way

NEW...

KANE MARK VI COMPUTER

All metal dead reckoning computer with metal slide. For wind triangle solution and time, distance, fuel consumption computation. Airspeed — altitude computation accomplished directly using Fahrenheit or Centigrade. Has drift and density altitude scales. In leather case.

$15.00 list

with direction manual $3.00 list

Introductory Offer, both **$8.85**

KANE SKYKING COMPUTER

Pocket size design of MARK VI. All metal with leather case and direction manual.

$5.00 list

Introductory Price

$2.50

KANE AVIGATION PLOTTER

Acclaimed the greatest advancement in plotter design. Precision engineered — simple to operate — crystal clear. Molded vinyl with beveled edges — not a sheet stamping. Dimensions: 16 x 3 x 3/16 inches. For Sectional and WAC charts. Outer scale in statute miles, center scale nautical. With leather case and directions.

$3.00

CAA EXAM

PASS CAA EASY

AIDS based on the very latest CAA requirements.

PRIVATE PILOT EXAM
New X-country type with charts, Flight Information Manual, Airman's Guide and Teletype data $3.50

COMMERCIAL PILOT EXAM
New X-country with charts..... $3.50

NEW ENGINE MECHANIC EXAM
With Oral and Practical, both..... $3.50

ATTRACTIVE DEALER DISCOUNTS
Money back guarantee on all items

KANE AERO EQUIP'T
MANUFACTURERS AND PUBLISHERS
1845 FORD PARKWAY
ST. PAUL 16, MINNESOTA

(Continued from page 64)

personnel and equipment.

The Woodlands Department has made it a matter of policy for the Company plane to fly routine fire-spotting missions when the woods are vulnerable to fires. These flights are usually made in the evening, after the men have left the woods. In this way, fires can be spotted and crews dispatched to combat them while they are still small. Last year the Company planes spotted three fires while on this routine. Of these, one was found to have been started from a lightning-struck stump; the second by a careless fisherman who left a camp-fire burning; and the third was of undetermined origin, although presumably also started by a careless human.

It is significant to note that, although the company has from 1,000 to 1,800 men employed in the woods all the time, not one fire has been reported in any of its operations—an impressive record. All key men in the Woodlands Department, including the pilots, are official Deputy Fire Wardens, empowered to take charge of any fire fighting activities until the arrival of State Forest Service officials.

The woods of Northern Maine have long been notorious as a prolific breeding ground for hordes of insects, mosquitoes, black flies and the tiny but formidable midges or "no-see-ums." These "bugs" have turned the woodsman's lot into a nightmare of misery since time immemorial. Obviously, the spraying of hundreds of square miles of woodlands would be prohibitively expensive. The IPC, never at a loss for ingenuity, came up with the idea of spraying some 25 acres around each camp. The idea worked. A camp area can thus be kept relatively insect-free. The company, having proved its theory of pinpoint spraying, turned the operation over to a commercial outfit. The practice has proved beneficial in holding labor, who might otherwise be tempted to "jack the job" until the end of the fly season. Now, the woodsman can sit outside on a warm summer evening and enjoy a peaceful smoke, unmarred by constant scratching and itching! END

Tips to Tyros

(Continued from page 51)

the Lynn Canal and you can land at Haines on a fine gravel port. Curly Powell will Volkswagen you to a fascinating village. Safer; *on your return* from Fairbanks, follow the Haines cutoff. The road looks good under you in an area where rain and fog can close in so quickly.

At Haines, one is still 90 watery miles from Juneau. The mountains descend to the ocean on both sides. I parked my Cessna with Curly at Haines and rode to Juneau with Alaska Coastal Airlines. That amphib was so comfortable.

The flight from Whitehorse to Northway can be rough. Check weather carefully; talk to an incoming pilot if possible. Weather around Kluane Lake is fickle. Whitehorse may clear you VFR, knowing that Northway is clear and 200 miles out, around the lake, you can find soup down to the deck. There is a good, gravel emergency strip at Burwash Landing. Gas is available in cans but there is no communication; if you cannot report your position in a couple of hours, Air Rescue will be looking for you.

In rain or smoke haze, it is easy to miss Northway Junction where a branch road leads 20 miles south to the airport. Watch for this junction if you have to depend on the highway. If your LF radio range signals are clear, home in. While you are now out of the mountains, this is lake and marsh country, excellent for moose but no place for a lost airplane.

Slightly less than halfway from Northway to Big Delta you will fly over the airport Tanacross. It has been abandoned. Use only in emergency and watch for holes in the concrete.

In this North Country, use *carburetor heat* for a few minutes every hour in normal flight. If you fly through rain, pull out that heat. If you note a slow drop in manifold pressure, pull out that heat. Before changing any throttle setting, especially during landing procedure, PULL OUT THAT HEAT.

If clouds hold you near the mountain tops or below, resist temptation to cut across country to meet the highway beyond. *Keep that road in sight.* Mountain tops look alike and there are valleys galore that run God knows where. Fly up the wrong one and you may never turn around.

Here are the distances:

	MILES
Seattle to Vancouver, B. C.	160 direct
Vancouver to Prince George Approx.	400 via. r.r.
Prince George to Fort St. Johns, approx.	240 via. r. r.
Great Falls to Lethbridge Approx.	270 airways
Great Falls to Edmonton Approx.	500 airways

(Continued on page 68)

★ ★ FLYING APPAREL ★ ★

MADE OF COMBED COTTON BYRD CLOTH TWILL

U. S. A. F.—K-2B FLYING SUITS
REGULATION SAGE GREEN
$18.50
INTERNATIONAL SURVIVAL ORANGE
$21.50
PLEASE STATE HEIGHT, WEIGHT, CHEST SIZE

COMPLETE WITH OXYGEN TAB, MAP CLIP, LEATHER NAME PLATE, CIGARETTE-PENCIL POCKETS, ZIPPERED BREAST, THIGH AND LEG POCKETS, DOUBLE LOCK FRONT ZIPPER

REVERSIBLE JACKETS
MOD. MIL-J-7448
ONE SIDE SAGE GREEN OTHER SIDE INTERNATIONAL ORANGE
$22.50
SAME AS ABOVE WITH WARM NYLON AND WOOL INTERLINER
$24.50
All Orders Postpaid If Remittance Accompanies Order or C.O.D. (C.O.D. in U. S. Only).

FRUHAUF SOUTHWEST UNIFORM CO.
DEPT. F 312 E. ENGLISH ST. WICHITA 2, KANSAS

Here's variety — DX'er, Sky-Trac, Traveler De Luxe, Traveler, Tri-Traveler

Choose from 5 spirited Champions

The complete line of low-cost high performance aircraft. If you're cost-conscious (and who isn't these days?) think of this—the highest priced Champions cost less than their lowest price competitors. Champion's hourly operating costs are far lower, too—just pin money—and we ask you to compare performance figures with any ship in Champion's class*.

Look at this lineup: TRAVELER and TRAVELER DE LUXE: Thriftiest of all light aircraft. Minimum cost, maximum performance with many comfort features of higher priced planes. TRI-TRAVELER: Pet of the flying schools, chosen as America's favorite training plane for its performance and ruggedness. SKY-TRAC: The most eager utility plane in the air today. For spray use, or on floats or skis, it's at home anywhere. DX'ER: The newest Champion with luxury appointments and extras found only in planes costing much more. Top performance, long range and high pay load factor make it an ideal ship for covering large sales territories at low cost. It's easy to own a Champion; factory arranged finance plan—only 25% down—up to 36 months to pay.

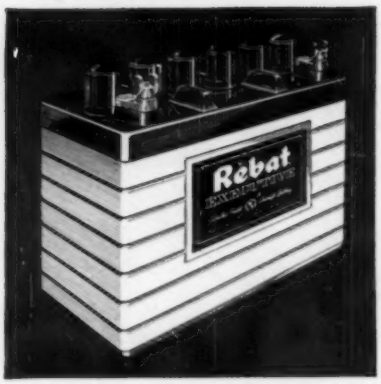
For more information and the name of the Champion dealer nearest you, write to Champion Dept. 5, Osceola, Wisconsin. A limited number of factory dealerships are still available.

**All Champions have basically the same rugged airframe — strongest in its field.*

It's more fun to fly anywhere in a

Champion

America's most rugged low price plane



NEW!

THE NEW REBAT EXECUTIVE . . . with Executive Bonding* . . . a world leader in quality, long life and dependable performance by the world's most experienced manufacturer of aircraft batteries.

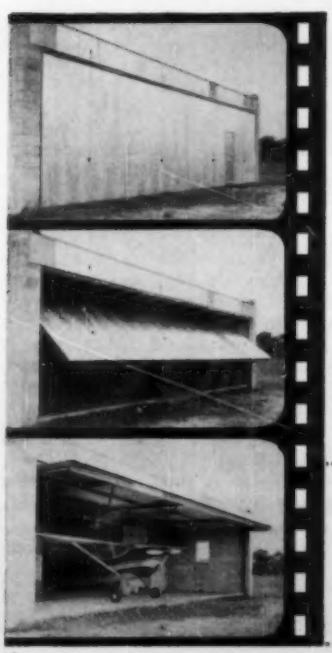
*An exclusive Rebat engineering achievement.

Rebat®
EXECUTIVE
...World's Finest Aircraft Battery

THE ELECTRIC AUTO-LITE COMPANY • BATTERY DIVISION • TOLEDO 1, OHIO

BOOK MANUSCRIPTS
CONSIDERED
by cooperative publisher who offers authors early publication, higher royalty, national distribution, and beautifully designed books. All subjects welcomed. Write, or send your MS directly.
GREENWICH BOOK PUBLISHERS, INC.
Atten. MR. YOURMAN 489 FIFTH AVE.
NEW YORK 17, N. Y.

We finance 1948 & newer model airplanes
Single and Multi-Engine
Specializing in financing dealers' retail sales
AIRCRAFT FINANCE, INC.
SKY RANCH AIRPORT
Box 5306 Denver 17, Colo. Phone EMpire 6-5509
Call or write for complete information



Up and Away..
...In seconds!
With This Easy-Operating "Electric Doorman" Hangar Door
Install the "Electric Doorman" hangar door in *your* hangar—at take-off time, your door and *you* will be up and away in seconds!

This easy-operating, tilt-up door can be hand-cranked or power-operated, opens in approximately ten seconds, folds up and away without taking up needed space.

Supplied complete with hardware and operator as a unit, to assure smooth, long-lasting, trouble-free service. Available in standard sizes, 40′ x 12′ electrically-operated door . . . $1440, and 60′ x 16′, electrically-operated door . . . $4224,both with steel, aluminum or translucent covering. Special sizes also available. Prices may be more or less according to requirements—insulation, pass door or plastic sheeting.
Prices K. D., F. O. B. factory

ELECTRIC POWER DOOR CO., INC.
2127 East Lake Street, Minneapolis 7, Minn. • PA 2-6685
Send full information on the Electric Doorman Hangar Door!
NAME_____
ADDRESS_____
CITY_____ STATE_____ 9-8

(Continued from page 66)

Edmonton to Fort St. John Approx.	515 highway
Fort St. John to Fort Nelson Approx.	235 highway
Fort Nelson to Watson Lake Approx.	360 highway
Watson Lake to Whitehorse Approx.	335 highway
Whitehorse to Haines Junction, approx.	100 highway
Haines Junction to Haines Approx.	154 highway
Haines to Juneau, approx.	90 water
Whitehorse to Northway Approx.	360 highway
Northway to Fairbanks Approx.	310 highway

Tower communication is 24-hour at Vancouver, Great Falls, Edmonton and Fairbanks. Check with RCAF in Canada for new operations to handle traffic.

For further information on hotel, motel rates, etc., contact The Alaska Visitors' Association, 1308 Tower Bldg., Seattle 4, Wash.: Att. Miss Kay J. Kennedy. END

Pilot Survival

(Continued from page 31)

and the built-in limitations of human reaction pitted against the rapidity of events during high-speed flight."

Caldara told us, "The Air Force gave Bendix a contract in 1956 to determine the feasibility of an anti-collision device. Last spring that company reported that true collision-avoidance systems were feasible. The FAA gave them the job of building a breadboard model. In the meantime we need an interim-type measure to give the pilot position and bearing data on potential collision. We also need more accurate altimeters."

The Air Force is testing two new altimeters. The first is a dial type called the MD-1, already in use on late model jet aircraft. The other is a moving tape presentation which is read directly. It is part of the new Air Force integrated instrument panel. One of the linear movement tape presentations currently developed incorporates a servo-driven mechanism which to a great extent eliminates the lag in altitude presentation due to high speed descent. The Air Force is looking for a fail safe system that can be incorporated into this altimeter to cause the system to revert to a slower aneroid type input in case of electrical power failure.

Caldara told us, "Present altimetry doesn't provide accurate altitude indications. Two aircraft with malfunctioning altimeters can find themselves on a collision course. To avoid a collision at 600 mph is virtually impossible because of the high closing speeds. The pilots have four seconds to get out of the way—if they see each other 20 miles apart. Yet the pilot's eyes are not focused on infinity. As a matter of fact, one and a third miles is about average at higher altitudes."

A B-47 recently landed at a USAF base. Part of the vertical stabilizer had been sheared off. The pilot said he had experienced a "near miss" with three other B-47s. A check was made for aircraft flying in the area. A flight of six was finally

(Continued on page 70)

WHAT! *ME...a SPACEMAN?*

Certainly, you'll be a "space man"– lots of young men today will be the space men of tomorrow.

Oh, not in the sense that you will be taking rocket trips to the moon – (although you may even be doing that). But rather that *if you are educated in engineering technology,* you will probably be engaged in some sort of space age research or manufacture.

The Aviation-Electronics Industries are already far along with advanced studies having to do with "space." Nothing can stand in the way of the Future – and the Future belongs to You – if you will prepare for it.

Northrop Institute of Technology

(NORTHROP AERONAUTICAL INSTITUTE)

1171 W. Arbor Vitae Street
Inglewood 1, California

NOW IS THE TIME

Get the education you need to become employed by an excellent company whose future may be limitless as the stars. Your earnings can be just as limitless too.

You can get this education at NORTHROP INSTITUTE. Engineering Technology programs require only two years to complete – or you may continue another year and obtain the Bachelor of Science Degree in the field of your choice. (See Coupon.)

Approved for Veterans

Mail coupon for complete information

NORTHROP INSTITUTE of TECHNOLOGY
1171 W. Arbor Vitae Street, Inglewood 1, California

Please send me immediately the Northrop Catalog, employment data, and schedule of class starting dates. I am interested in:

- ☐ Aeronautical Engineering Technology
- ☐ Electronic Engineering Technology
- ☐ Aircraft Maintenance Engineering Technology
- ☐ Airframe and Powerplant Mechanic
- ☐ Jet Engine Overhaul and Maintenance

Name..... Age...

Address .....

City..... Zone... State.....

Veterans: Check here ☐ for Special Veteran Training Information.

AIRLINE OPERATIONS TRAINING, INC.

is now offering for the first time

COMPLETE GROUND SCHOOL COURSES

for the

PRIVATE, COMMERCIAL & INSTRUMENT PILOT

These courses are conducted by a staff of professional Airline instructors. Courses include Meteorology, Civil Air Regulations, General Service of Aircraft, Radio Navigation, Air Traffic Control, Instruments, Link and Navigation featuring a newly designed

NAVIGATION SIMULATOR

for practical navigation check out.

Call or write for brochure.

AIRLINE OPERATIONS TRAINING, INC.

At New York International Airport

152-25—138th Avenue

Jamaica 34, New York

Fieldstone 1-2600

BRITISH R.A.F. PILOT'S

ROYAL WEBLEY, .38 S&W CAL. $14.95

These superb revolvers made by Royal crown arsenals purchased directly from British Air Force Ordnance. As no expense was spared in outfitting R.A.F. pilots, these are the cream of British service handguns. 6-shot revolvers, double and single action with broad hammer spur for easy single action shooting. 5" barrels, lanyard rings, ordnance tested and stamped with British Crown and Broad Arrow acceptance marks. These guns were almost never fired. Condition very good, mechanically perfect. Civilian equivalent value about $70. Fires standard U.S. .38 S&W ammo. AMMO: 50 rds., $3.50. ORDER ON FREE TRIAL! 10 day money back guar. Send check, cash or M.O. $5 deposit for C.O.D. Shipped F.O.B. Los Angeles. In Calif. only order through your gun dealer. Dealers inquire.

WEAPONS, INC.

11029 Washington Blvd. Culver City 107, Calif.

(Continued from page 68)

identified. One of the bombers had a gash running the length of the fuselage belly. Of the twelve people in the flight, not one had seen the lone B-47 nor was the crew of the damaged jet aware that they had been side-swiped in mid-air.

Looking to the immediate future, Caldara speculates, "Pretty soon we'll have Mach 3 transports as well as military bombers. We're going to require a reliable anti-collision device because we'll need warning at 125 to 150 miles. I think a transponder might do the job."

In discussing this with the General, we suggested that a radio transponder might prove to be too expensive for all aircraft. He recalled, "Back in 1929 when I was taking flying lessons at College Park, I knew a man there who thought that lights on airplanes would be 'too expensive'. Already Edwards Flight Test Center is working with Motorola to develop a radio transponder that shows great promise. It is limited in distance but it will provide adequate time for the pilot to take necessary avoidance action. It's a cooperative device—it must be installed in all aircraft. Most important of all, it is estimated that it will be of reasonably low cost."

We drifted into a bit of hangar flying and Caldara recounted, "A few months ago I was making an ILS approach into Los Angeles International. My co-pilot, with whom I had been flying for six years, suddenly horsed the yoke back. There, chugging right across the glide slope, was a light airplane. We were under actual instrument conditions—Los Angeles, Burbank, El Toro and San Diego were all reporting instrument weather. Yet this character was flying VFR across the most heavily traveled single track in the Los Angeles area."

Smokey says many private pilots are outstanding airmen, but qualifies this with the thought that a lot of pilots just don't get enough time to keep proficient. He says this is also true of military pilots, especially staff officers who are tied to their desks. The DFSR has recently concluded a statistical study on jet flying accidents. Pilots flying up to 20 hours in six months average 175 accidents per 100,000 hours, while pilots who fly 80 to 100 hours in the same period experience only 38 accidents per 100,000 flying hours.

Enthusiastic in describing the excellent flying safety record of "week-end warriors," Smokey claims that their accident rates compare favorably with the Air Force's. Their record is even more impressive when you remember that most National Guard pilots made the transition to jets right in their own outfits.

Asked whether accident records of F-84s and Fairchild Packets and some of the other aircraft given the Air Guard compared with overall Air Force experience, Caldara replied, "In most ways it's better. The longer an aircraft is in the inventory, the more chance we have of getting all of the bugs out of it. And, too, the Air National Guard has an excellent maintenance record. As an example, some time ago we established a technical order change of one of our generators. The Middletown Air Materiel Area arranged for fly-in service for ANG aircraft and the modification was completed in a record five weeks as compared with the six months that had been originally programmed."

We complained that the rules for high-performance aircraft were making it harder for the light aircraft pilot to fly locally. Couldn't a plan be devised to give the light plane pilot some air space he could call his own?

General Caldara flashed a grin. "I mentioned the case of the near miss on the ILS track. Fifty-nine per cent of our Air Force accidents occur at 2,000 feet or less. Actually 16 per cent occur on take-off and 43 per cent on landing. Any time you get both feet off the ground, you can get hurt. Right now, some light aircraft are cruising at 210 and are way out of the 'amateur' class. Whatever their speed, aircraft are in the air. The pilot has to be proficient. The plane has to be equipped or stay out of certain areas. We don't permit pedestrians or bicyclists on freeways, do we? I don't want to encroach on anyone's prerogatives or liberties or deny anyone anything. But I have had a commercial ticket for 29 years and I have seen a lot of things happen. All pilots have a common responsibility. That's an inherent part of being a pilot." END

"Routine—a little weather, a bit of turbulence, some falling debris from detonated missiles."

READY FOR A FLYING START

AS A U.S. AIR FORCE NAVIGATOR

The Air Force navigator is a man of many talents. He is, first of all, a master of the skies—and no finer exists. In addition, he has a firm background in astro-navigation, electronics, engineering and allied fields. Then, too, he must show outstanding qualities of leadership, initiative and self-reliance. In short, he is a man eminently prepared for an important future in the new Age of Space.

Find out today if you can qualify as an Air Force navigator. Paste the coupon below on a postal card and mail it now.

GRADUATE THEN FLY

U.S. AIR FORCE
AVIATION CADET PROGRAM

MAIL THIS COUPON TODAY

Aviation Cadet Information, Dept. AF-98
Box 7608, Washington 4, D. C.

Please send me details on my opportunities as a navigator in the U.S. Air Force. I am single, between the ages of 19 and 26½, and a resident of the U.S. or possessions.

Name_____

Street_____

City_____ Zone____ State_____

"FOR THE PILOT WHO HAS ALMOST EVERYTHING"

If you appreciate perfection of detail, you will be proud to own our new and improved radial engine cuff link set. Exact in every detail from its splined shaft down to practically every nut and bolt, the cuff links are available in either gold or silver non-tarnishing rhodium finish. Also available in sterling silver at $12.50 the pair or 14K Gold filled at $18.00. The tie bar is an authentic replica of a constant speed propeller and is available in either gold or silver non-tarnishing rhodium finish. Sterling silver $5.00, 14K gold filled $7.00. Prices include 10% federal tax and postage.

CUFF LINKS . . . $5.00
Gold or Silver Rhodium

PROPELLER TIE BAR . . . $3.00
Gold or Silver Rhodium
The set $7.50. Postage and tax included in above prices

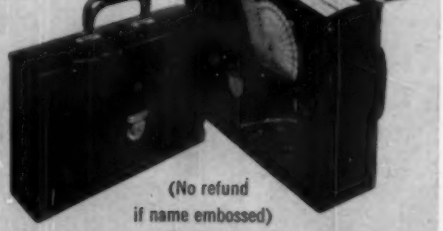
Special discounts to flying clubs and business firms on quantity orders. Write for free brochure of other pilot gifts and accessories.

VFR MAP CASE

- Designed specifically for the Private Pilot.
- Fits easily in the cockpit of any light plane.
- Rigid Construction • Top Grain Cowhide.
- Your choice of black or ginger.

A place for everything in this compact 3¼" x 9¼" x 13¼" map case. The top folds back for easy access. A pocket for sun glasses, computer and plotter. Sections for Airman's Guide, Airport Directory, Sectional and World Air Charts. Locks with a key. Your name embossed in gold $1.00 extra.

$24.75
postage and 10% Federal Tax included.



(No refund if name embossed)

Satisfaction Positively Guaranteed or Your Money Back!

Varsity Shop SPECIALTIES
Specialists in Pilot Gifts & Accessories

WHEN IN DALLAS, SHOP OUR TWO FINE MEN'S STORES

Varsity Shop Specialties
138 years continuous business!
6321 Hillcrest Ave.
Dallas 5, Texas

CUFF LINKS
☐ Gold Rhodium $5.00
☐ Silver Rhodium
☐ Sterling Silver $12.50
☐ 14K Gold Filled $18.00

PROPELLER TIE BAR
☐ Gold Rhodium $3.00
☐ Silver Rhodium
☐ Sterling Silver $5.00
☐ 14K Gold Filled $7.00

VFR MAP CASE
☐ Black ☐ Ginger

_____ Amount Enclosed

NAME
ADDRESS
CITY ZONE STATE
☐ Cash ☐ Check ☐ Money Order ☐ C.O.D.
(50¢ extra for C.O.D. . . . No C.O.D.'s to Canada) 3

GABB TIME-RITE PISTON POSITION INDICATOR

The standard aircraft engine timing tool for the fastest, simplest, and most accurate method of indicating piston position and timing. Installed in the cylinder spark plug hole, Time-Rite performs all phases of precision engine timing by direct measurement of piston travel. The precise, sturdy, light and compact construction of the Time-Rite makes it equally valuable for shop or field use. Write for free brochure No. T-102.

GABB SPECIAL PRODUCTS Inc.
WINDSOR LOCKS, CONN.

Wings for the Army Guard

(Continued from page 49)

Lieutenants Sunday and Caldwell, at New Kingston, are typical of the Army Guard's pilots. Sunday, a farmer and sawmill operator, is a former Army Air Forces B-17 pilot. Caldwell, an interstate bus driver, is also an AAF veteran, having flown B-17s, B-24s and B-29s during both World War II and the Korean emergency. They are required to meet the same physical and flying proficiency standards as any active-duty military pilot, with regular re-checks by Guard and Regular Army medical and proficiency boards. They and their fellow Army Guard pilots average 116 hours of flying time per year. The Army Guard as a whole expects to put in a total of 145,000 hours during fiscal 1959.

Because of their close association with ground combat, Sunday and Caldwell must attend at least one drill per month with the ground component of their unit and attain a working knowledge of armored tactics and equipment. The latter is achieved either through correspondence courses administered by the Regular Army or by attending the Armor School, Fort Knox, Ky. A similar program is in effect in the infantry, artillery and support components.

All of this adds up to a total considerably above the minimum of 48 drills and the 16 to 18 days of summer training required. The hours contributed over and above the required minimum, and the enthusiasm of its people has always been the Guard's greatest asset. "I would come down here whether I got paid for it or not," Sunday says. "I like to fly."

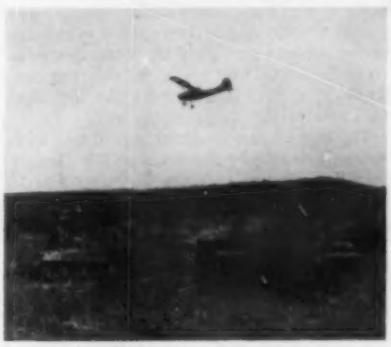
Pay is at the rate of one full day's quota, plus flight pay, for each drill attended. Full base pay, flight pay and allowances are paid for the summer encampment. The total, for a first lieutenant, can come to approximately $1,000 per year.

All Army Guard pilots are officers. Most, like Sunday and Caldwell, are former Air Force, Marine Corps or Navy flyers. The door is wide open, however, to the National Guard enlisted man who wants to fly. To become an Army Guard pilot, the young Guardsman must first qualify for a commission in a combat branch or in one of the support branches which are authorized aircraft. This covers all but a few of the Guard's units. Next, he must pass the requisite physical and mental requirements and be able to take leave of his civilian job long enough to complete active-duty flight training at one of the Regular Army's military or contract training fields. Upon receiving his wings, the Guard pilot returns to his unit and to civilian life. The army's entire program of advance flight and helicopter training is open to him whenever he can spare the time from home and job.

Each State is authorized a 50 per cent "overage" of Army Guard pilots in order to qualify the maximum number possible. The result is a happy combination of pilots and non-rated officers in command and staff assignments. The Guard performs its own maintenance, up to depot level. To accomplish this, it employs a

force of 481 full-time technicians who, though they wear the uniform during the duty day, are civilians working in a civil service status. Lt. Col. Wayne E. Phillips, Army Aviation officer at the National Guard Bureau, Washington, describes this force as "the best-trained, most readily available source of aircraft maintenance personnel anywhere within the Army today."

"Because of successive cuts in support personnel," Colonel Phillips explains, "the Regular Army is forced to use its own technicians for a thousand and one non-aviation purposes. The result is that only a fraction of their time is spent maintaining aircraft. The National Guard technician, on the other hand, spends eight hours a day, every day, maintaining aircraft or advancing his technical knowledge at service school or under the supervision of competent line chiefs. Thanks to this, and to the Guard's training and flying safety programs, the aircraft accident rate was held to 19.4 per 100,000 flying hours in fiscal 1958, a figure that compares very favorably with that of the Regular Army."

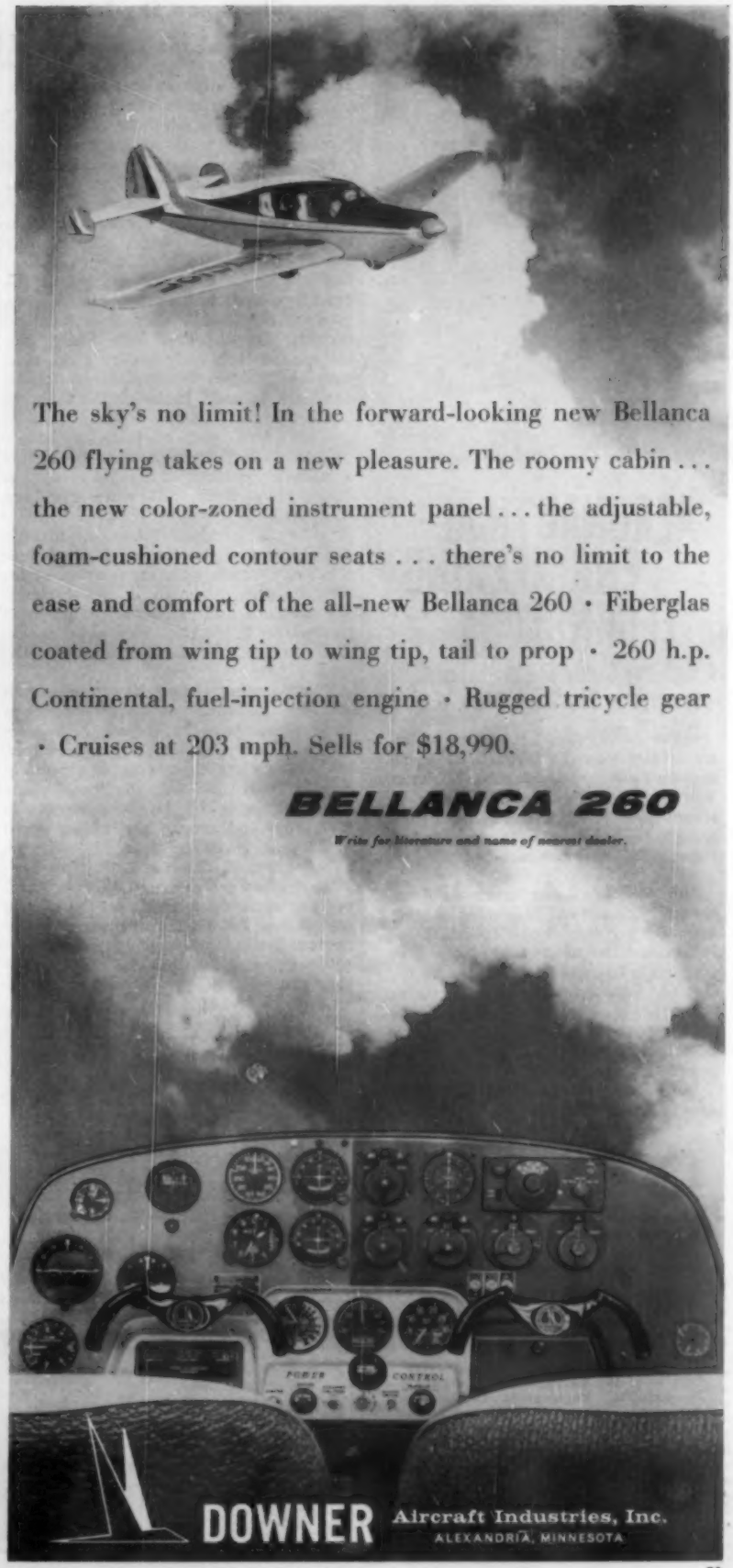


An Army National Guard pilot coordinates the action of tanks on the ground during maneuvers.

Backing up the full-time technicians is a somewhat larger force of Guard mechanics who drill with their units on the normal, part-time basis.

"There is an excellent opportunity," Colonel Phillips points out, "for the airline or small airport mechanic to fulfill his military obligation in an assignment of this type. We need now, and will need even more as Army Guard aviation expands, instrument, metal, hydraulic, welding, propeller, rotor blade, power train and aviation engine maintenance personnel. For the high school graduate interested in an aviation career, the Guard offers an opportunity to train at Regular Army technical schools. He can then return home to a full-time job with the Guard, if there is an opening, or part-time training with the Guard and a full-time civilian job at a nearby airport.

The challenge to the Army pilot is as great, in its own way, as that facing the Air Force pilot. Landings and take-offs from short, difficult fields, a minimum of navigational aids and the ever more pressing need of the ground commander to know what is on "the other side of the hill" have always kept the Army aviator busy and interested. END


The sky's no limit! In the forward-looking new Bellanca 260 flying takes on a new pleasure. The roomy cabin . . . the new color-zoned instrument panel . . . the adjustable, foam-cushioned contour seats . . . there's no limit to the ease and comfort of the all-new Bellanca 260 • Fiberglas coated from wing tip to wing tip, tail to prop • 260 h.p. Continental, fuel-injection engine • Rugged tricycle gear • Cruises at 203 mph. Sells for $18,990.
BELLANCA 260
Write for literature and name of nearest dealer.
DOWNER
Aircraft Industries, Inc.
ALEXANDRIA, MINNESOTA

With Embry-Riddle

AERONAUTICAL ENGINEERING TECHNOLOGY

A High-Pay Career and Professional Prestige in Two Short Years

• The Aeronautical Engineering Associate holds a respected position. He is the engineer's executive officer. He must know both engineering theory, down-to-earth application, and missile and space-flight technology. He is indispensable. The demand for qualified young men exceeds the supply.

Embry-Riddle's 2-year course in Aeronautical Engineering Technology is fully accredited by the Engineer's Council for Professional Development. Graduates take positions as Engineering Associates. Yet the time and tuition costs are CUT BY HALF as compared to 4 years of college. Being "two years ahead" can also mean thousands of dollars of added income and higher-pay promotions.

Write for Free book about the tremendous opportunities.

Embry Riddle
AERONAUTICAL INSTITUTE
AN ACCREDITED TECHNICAL INSTITUTE

Director of Admissions
Embry-Riddle Aeronautical Institute
Dept. D, Aviation Building
Miami 52, Florida

I want to be in the lead of the air frontier. Send me background material on Aeronautical Engineering Technology Training.

Name_____

Address_____

City_____ State_____

MAIL THIS COUPON TODAY!

Champion Sky-Trac

(Continued from page 41)

To assure the airplane was loaded close to gross, Woody rode along on some of the checks, and a neighbor of mine, Ed Keehn, accompanied me on the others.

Recommended starting procedure for the Lycoming is several shots of prime if the engine is cold; master switch on; engage starter; and, after two or three revolutions of the prop, the ignition switch is turned to "Both". The Lycoming dances for a second or two as the cylinders begin to fire, then settles down to a smooth idle. With a little touch of throttle, the Sky-Trac rolls easily over the ground. Visibility is very good, even over the nose as the airplane sits on its conventional gear. In the air the visibility is excellent. Control on the ground is positive and the effective hydraulic brakes allow the Sky-Trac to be turned sharply in and out of tight places. The brakes also hold well when checking mags at 1,800 rpm (maximum allowable drop is 125 rpm) and the full throttle static power of the engine. I noted here that the Lycoming 140 hp is smooth running in going through its static range. Oil pressure and temperature indicated normal, so I lined up with the runway and ran the throttle to the end of the stop.

That morning at Lost Nation, elevation 626 feet, the wind was from the south at 10 knots, air temperature was 47 degrees F. The Champ accelerated rapidly and, without any urging, was off the ground in approximately 265 feet. As the airplane gained flying speed, I reduced power to 2,500 rpm and set up a climbing speed of 70 mph (book recommends 66 mph as best rate of climb speed). The Sky-Trac climbed out at over 1,000 fpm. without any apparent laboring on the part of the engine. Although there was no cylinder head temperature gauge on the airplane I flew, I felt that the oil temperature gauge would give a good reference. In a climb to 10,000 feet, I found:

ALTITUDE	AIRSPEED mph	RATE OF CLIMB plus fpm	RPM	OIL TEMP. deg. F.
1,000	75	1,000	2,500	150
2,000	75	1,000	2,500	155
3,000	75	900	2,500	160
4,000	75	850	2,500	170
5,000	75	800	2,500	180
6,000	75	700	2,500	185
7,000	75	660	2,500	185
8,000	75	600	2,500	189
9,000	75	550	2,500	189
10,000	75	500	2,500	187

It was interesting to find that the Champ performs so well at 10,000 feet. The manufacturer's specs list the service ceiling of the Sky-Trac as 18,000 and the absolute ceiling at 20,250 feet. I feel sure the aircraft easily can meet those figures. Also, I was interested to see that there is adequate cooling at the lower airspeed. The maximum oil temperature allowable is 240 degrees F.

While at 10,000 feet, I made note of the effectiveness of the heater. It has been my experience that heaters in light aircraft fall short of supplying an adequate quantity of warm air. But not so in the Sky-Trac. The high volume of heat kept both myself and Ed Keehn in the back seat very comfortable, despite an outside air temperature of –20 degrees.

I made checks to test directional and longitudinal stability. In checking directional stability, the nose of the Champ was put on a point on the horizon, and with wings held level, right rudder was fed in to skid the airplane. Upon release of the rudder pressure the Champ's nose went back to the point on the horizon. Equally as satisfactory was the left skid and recovery.

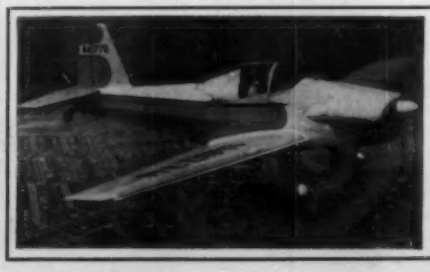
To check longitudinal stability, with cruise power set, the nose of the Champ was pulled up until the airplane lost 10 per cent of its forward speed. Then the control stick was released. The airplane went through two oscillations without exceeding the red line, leveled out and returned to cruise speed of 120 mph.

The Sky-Trac rolls into and out of turns with a good, positive rate of roll. Even at low airspeeds of 60 mph, the elevators respond with only slight control stick movement. Woody Coche says that the better aileron control has been achieved by shortening the wing span of the airplane. Previous models of Champs have a wing span of 35 feet 2 inches, while the Sky-Trac measures 33 feet five inches, or one foot, nine inches shorter.

Power-off stall occurs at 45 mph, as close as I could read the airspeed—the specs say 42.6 mph. There is ample buffeting as a warning before the nose falls through.

It was pleasing to note that the soundproofing of the Sky-Trac has reduced the cabin noise level. Ed Keehn and I were able to converse with near normal volume. Also I listened to weather sequences and nearby control tower instructions on the built-in loud speaker without any difficulty. Ignition noise was practically non-existent when I turned the Superhomer off a station frequency and listened to background noise. These

(Continued on page 76)



BUILD a SKYHOPPER

NOW SINGLE OR TWO PLACE— PLANS $80.00 Money Back Offer!

Clear, simplified and easy to read drawings. All ribs and fittings are drawn full size and may be used directly as templates in making parts. 260 sq. ft. of drawings supplied. Planes eligible for CAA license. SPECIAL OFFER . . . INBOARD AND 3-VIEW, PHOTOS, DATA . . . $2.00.

SKYHOPPER AIRPLANES, INC.
3800 Enville Place, Dept. F, Los Angeles 16, Calif.

Announcing the sale of

MORE PAYLOAD PER DOLLAR

than any other licensed cargo aircraft.

For many years the C-46 has been an economically operated, hard working performer for the United States Air Force. Now private operators, such as yourself, are being given the opportunity to purchase these aircraft and take advantage of their high-profit capabilities.

CREDIT TERMS AVAILABLE

The General Services Administration has arranged to make credit terms available to qualified, domestic buyers. Requirements include: basing the aircraft within the United States, Puerto Rico, or the Virgin Islands until full payment has been made; minimum down payment of 25% of the purchase price; payment of the balance in 36 equal monthly payments with interest at 5% on the unpaid balance. You will be furnished detailed credit information upon request of the sales catalog.

INSPECTION: 10-18 AUGUST

The models to be offered for sale are the C-46A and C-46D. These aircraft are adaptable for both freight and passenger use. The C-46 is eligible for Federal Aviation Agency "Type Certification" in "Normal" and "Transport" categories upon completion of necessary modifications.

PRICE RANGE: $50,000-$60,000

The prices of the 110 C-46's to be offered for sale are $50,000, $55,000 or $60,000 depending on the condition of the individual aircraft. The sale will be conducted on a "first come—first served" basis. Should the occasion arise when two or more buyers simultaneously attempt to purchase the same aircraft, lots will be drawn and service provided in the resulting numerical order. Aircraft records will be available for your use during the inspection period.

SALE BEGINS: 19 AUGUST

ALSO . . . B-26 FIXED PRICE SALE

Inspection: 10-18 August Sale Begins: 19 August
Price Range: $1,500-$5,000
No Credit Available

Arizona Aircraft Storage Branch
Davis-Monthan Air Force Base
Tucson, Arizona

Arizona Aircraft Storage Branch
ATTN: ZDS-A
Davis-Monthan Air Force Base
Tucson, Arizona

Dear Sir:

Please send me a copy of the Sales Catalog for the sale of

☐ C-46 Aircraft ☐ B-26 Aircraft

Name_____

Address_____

City_____ State_____

(Continued from page 74)

low level noise features plus the soft seats, ample leg room, excellent visibility and 120-mph cruise certainly are inviting to cross-country flying in the Sky-Trac. Range at maximum cruise power setting is about 492 miles (no wind, no reserve). At economical cruise, the range is extended to 638 miles (no wind, no reserve). Fuel consumption at 2,400 rpm is seven gph, and at 2,200 rpm it is six gph.

Landing technique used for the Sky-Trac is similar to that used for the general Champ family. At a gliding speed of 65 to 70 mph, the glide is somewhat flat and this is coupled to a good sink rate when the airspeed is reduced to 55 mph and under. Thus it is rather easy, without flaps, to spot land the 140-hp Champ. Usually I trim the Champ to hold the glide on its own, and then when back pressure is applied to the control stick to level off over the runway, the three-point attitude comes about somewhat automatically and the Champ settles gracefully on its "no bounce" landing gear.

Other features which interest me included the removable rear seat which then allows 31 cubic feet of baggage space; the adaptability as a spraying rig which can be achieved with the addition of a Sorenson Super Spray unit which comes custom-built for the Sky-Trac—both internal and external units with capacities up to 90 gallons.

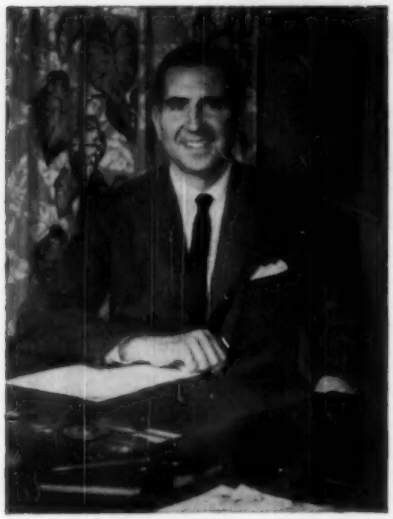
Wing loading of the Champ Sky-Trac is 9.69 pounds/sq. ft. and the power loading is 12.22 pounds/hp. Price of the standard model is $6,550. Construction is welded tubular airframe and the wings have all-aluminum ribs; the covering is grade A fabric covered with 17 coats of butyrate dope.

I certainly enjoyed flying the Sky-Trac. It offers, in my opinion, performance, economy, safety, low maintenance, and utility for the salesman who flies alone and makes 100 to 500 mile trips; the farmer who needs versatility and "workability" in his aircraft; and the pipe line patroller; the mountain pilot who flies from high altitude fields, and others who require a rugged, high performing, two-place lightplane. END

CHAMPION SKY-TRAC

Manufacturer's Specifications

Engine	Lycoming 0290-D2-B, 140 hp
Wing Span	33 ft. 5 in.
Length	22 ft. 1 in.
Empty weight	931 lbs.
Gross weight	1,650 lbs.
Useful fuel	37 gals.
Top speed	160 mph TAS (red line)
Cruising speed	120 mph, TAS
Stall speed	42.6 mph TAS
Rate of climb	1,040 fpm @ SL
Cruising range	638 miles
	(Economy cruise, no reserve)
Service ceiling	18,100 ft.
Basic price	$6,795



"Flying a plane is not only a pleasant pastime, but also a necessity in my business. Next time you touch down at a Manger city, we will be most happy to serve you with friendly hospitality."

Jules Manger

"Flying Businessmen" appreciate Manger Hotels' ideal locations, excellent accommodations and fine food. For a Manger Credit Card and information, write: Executive Offices, 4 Park Avenue, N. Y. C.

Manger Hotels

ALBANY, N. Y.
THE MANGER
DeWITT CLINTON

CHARLOTTE, N. C.
THE MANGER MOTOR INN
(Opening Late 1959)

CLEVELAND
THE MANGER

GRAND RAPIDS, MICH.
THE MANGER

NEW YORK CITY
THE MANGER VANDERBILT
THE MANGER WINDSOR

ROCHESTER, N. Y.
THE MANGER

SAVANNAH
THE MANGER
THE MANGER TOWNE & COUNTRY MOTOR LODGE

WASHINGTON, D. C.
THE MANGER ANNAPOLIS
THE MANGER HAMILTON
THE MANGER HAY-ADAMS

The Friendliest Name in Hotels

SURVIVAL KITS

A NECESSITY FOR ALL RESPONSIBLE PILOTS!

We design, manufacture and offer:

Master Pilot Kit DeLux C-2
Passenger Kit P-1
Desert Pilot Kit DeLux D-2
Economy Pilot Kit C-4
Northern Pilot Kit DeLux N-2
Special Pilot Kit CAP
Navy Survival Kit NA-2
Victor Survival Saw SS-5
Survival Axe (14¼") 681-CZ6
Survival Vest MK-2
Rubber Boat PK-2
Combination 16½" Survival Axe & Saw 661-S-CZ4
Signalling Mirrors, Flares, Fluorescent Insect Headnets

Give License number, type of your plane and area of use to receive full particulars on Kit best covering your need.

SURVIVAL EQUIPMENT CO.
Div. of Victor Tool Co., Inc.
Dept. 608 Oley, Penna.

THE JET AGE
AND ITS IMPACT ON PILOTS

Write for Brochure and Full Information on

VISUAL TRAINING
FOR AIR LINE PILOTS
AND CANDIDATES FOR
PILOT RATING

To Meet Eyesight Requirements of Periodic Company and C.A.A. Exams

DR. JOHN T. FLYNN
OPTOMETRIST - ORTHOPTIST
Visual Training Specialist
300 W. 23rd St., New York City
By Appointment Only WA. 9-5919

YOU CAN OWN A COPTER!
Learn about the original Bensen copter-type craft

Simple to fly, low cost—easy to build too! Acclaimed by professional and amateur flyers around the world. Build it yourself, with engine or as inexpensive glider type which can also be mounted on floats or boat. Get 3-view drawings, specs, in-flight photo of Glider for $1 or motor powered Gyro Copter $2. Building plans and kits also available.

Send $1 or $2 BENSEN AIRCRAFT CORP., Dept. F-89
P. O. Box 2746, Raleigh, N. C.
Name
Address

Memorial to a Pioneer Hero

(Continued from page 45)

on their momentous missions around the world. Presidents and princes countless times have trod its tarmac. And, of course, thousands and thousands of pilots have been briefed out on every conceivable kind of mission from its operations room.

The memories of some of us, before the field was expanded, run back to weird landings across field when the turbulence of the wind along the hill by Saint Elizabeth's Hospital made the job practically an exercise in low altitude acrobatics. Nor was a landing across the river at times any better. When ships had no brakes, I recall once ground-looping smack into an empty hangar, by fright and dumb luck, without a scratch to plane or building.

When the airplane came along to the place where dignitaries of government used assigned planes, Command at Bolling Air Force Base (designation was changed in 1948 from "field" to Air Force Base) was shunned by the savvy nominee. Crew chiefs, backed by the implied status of their standing with the "boss," could make a colonel feel very uncomfortable. Bolling has not accumulated its history without a vast blending of fun and fury, politics and counter politics, mystery and romance, courage and tragedy. To tell its story as it served alone for many years at the heart of the national government, is not the purpose of this article—but it would make very good reading for chuckles and excitement—and a few tears.

One element of its story, however, must not be left to popular writing—something of the man for whom the base was named in memory.

Raynal Cawthorne Bolling, a former New York National Guardsman and original protagonist of the Air Reserve concept, flashed like a missile across the early aviation scene and disappeared into the mists of air history with scarce a trace of deserved fame except that the first air field to be called for a deceased combatant of the air arm bears his name. Few of us in the Air Service, especially in the A.E.F., knew him other than casually. We vaguely appreciated that he was on our side—saw aviation as other than a nuisance—but, if we thought much about him at all, it was as a brash reservist who could temporarily hold his own with the brass because he had political stature at home. This then in no sense can be considered a biographical sketch of the U. S. Steel Company attorney who became a Minute Man of the air age, yet any story of Bolling AFB would be a half-told tale, if the man and his part in history were not highlighted.

One personal impression has remained with me over the years—that he was one of the early few with some grasp of the offensive potential of airpower. Whether he got this viewpoint after he came to Europe or previously held it, I can not say. At the time, the airplane was employed mostly in one or another form of reconnaissance and in so-called "pursuit."

(Continued on page 78)

McCAULEY Met-L-Matic

Helps Max Conrad's Piper COMANCHE To New Light Plane Record

Max Conrad's 7,683-mile flight from Casablanca to Los Angeles is more than a new light plane distance record. It's new evidence of the greater efficiency, safety and economy you can expect with McCauley constant-speed propellers. Quality is an integral part of McCauley's Met-L-Matic design, manufacture, final testing. Only such high standards of perfection could provide a flawless flight over the 7,683 miles Mr. Conrad flew. That's why McCauley is the first choice of discriminating light plane pilots everywhere.

The 250 hp Piper Comanche which Max Conrad flew from Morocco to California carried more than 500 gallons of gasoline . . . 5 times normal fuel capacity. This meant extra weight. But the veteran pilot of 56 trans-Atlantic flights knew the McCauley Met-L-Matic propeller was designed to do this seemingly impossible job. Built-in strength under excessive load assured faultless performance.

fly the finest . . . fly **McCAULEY**

McCAULEY INDUSTRIAL CORPORATION
1840 Howell Ave., Dayton 17, Ohio

More personal and business aircraft are equipped with McCauley propellers than any other kind.

Cap'n Sharp Says:

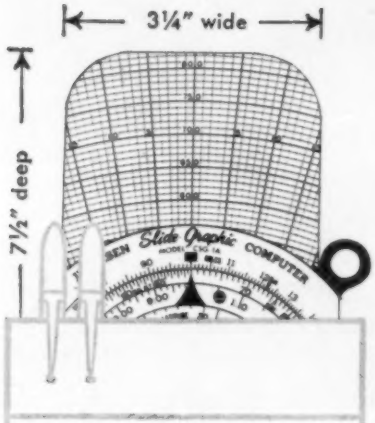
"The

CSG COMPUTERS

are selling like

MAD!

...Got yours?"



- *NEW POCKET MODELS*
- *ADVANCED DESIGN*
- *USE WITH "Cub" to jets*

Handy CSG-1 "Pocket" Model
White Plastic. . . **$10.00**
Aluminum **$15.00**

Also available:
CSG-2 "Navigator" Model
(½ larger)
Plastic. **$12.50**
Aluminum **$15.00**

See your distributor, dealer, write or mail coupon

JEPPESEN & COMPANY
Stapleton Airfield • Denver 7, Colorado
Please rush my new J-2 catalog.

Name _____

Address _____

City, State _____

Jeppesen & co.
Stapleton Airfield • Denver 7, Colorado

DISTRIBUTORS: Air Associates-Alaskan Aircraft Equipment Supply (Anchorage) • Aviation International Corp. • General Aviation Supply Co. • Aeronautical Services (Honolulu) • Merrell Aviation • Pan-American Navigation Service • Sky Store • Standard Products, Inc. • Timmins Aviation Ltd. (Montreal) • Van Dusen Aircraft Supplies

OVERNIGHT STOP—No. 52

Clauson's Inn & Country Club

No. Falmouth, Mass.

PRACTICALLY under your wing tips when coming in on Runway 5 at Coonamessett Airport, Clauson's overlooks Coonamessett Lake and Round Pond. More than a favorite eating place, the AAA-approved Inn is a year-round resort, set in the midst of 2,300 private acres, with guest cottages, a two-story annex, called the Lodge, a private swimming pool and an 18-hole golf course. Altogether it is a self-contained vacation spot in an atmosphere of informal country club living. One may swim in pool or lake; indulge in lake water sports, or play tennis or golf. In the evenings music is provided at the cocktail and dinner hour; and the famous Falmouth Playhouse is a stone's throw from the Inn's Terrace dining room.

Although a fresh-water resort itself, Clauson's is within easy reach of salt water recreation, historic sites, art colonies and many other points of interest.

Summer rates run $14-$18 per day for two persons, European plan, $28 for suites.

Coonamessett (Falmouth Municipal) Airport, 6 mi. NE, Elev. 100 ft., has three unpaved runways, the longest NE 4,500 ft. (Strip lighting on NE/SW runway only). Mgr. George Pinto. Services: Unicom, 80 oct. gas. Taxi, restaurant, car rental. All IFR flights under control Otis AFB. (For more details see page 89.) Manager Pinto emphasizes community relations with Otis AFB are extremely friendly.

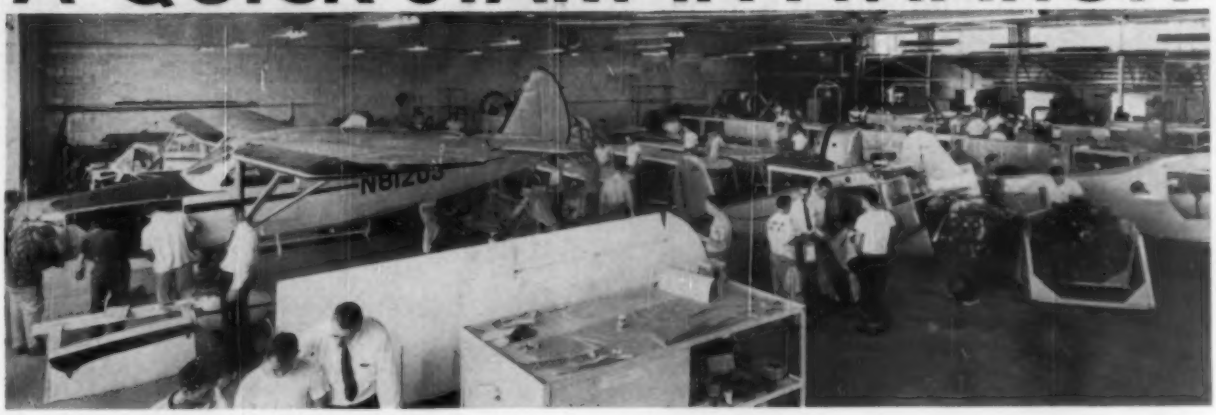
(Continued from page 77)

All belligerents did some short-range bombing and indeed the Italians, with their Capronis, even had a "strategic" program but, by and large, aviation was cavalry—and damned be he who claimed more. I doubt that Bolling foresaw the full offensive utility of the airplane but I think he saw enough to be classed as a borderline "radical." I'm sure he at least had convictions on "mass employment"—enough honor among military heretics for any man.

Bolling was a distinguished lawyer and solicitor general of U. S. Steel, when first exposed to the backwardness of American aviation at Plattsburg in 1915. The single Gallaudet plane available for instruction was in sad contrast to planes then in vogue—and in combat—with the warring powers in Europe. Bolling was sure the United States would inevitably become involved in that combat and would have nothing to offer airwise. Instead of condoning this situation or contenting himself with lament and complaint, he took what action one individual could. He had

(Continued on page 80)

A QUICK START IN AVIATION



Meaningful Education and Specialized Training do Wonders in a Short Time

• Miami, Florida: This "classroom" shows students in the Airframe and Powerplant Technician course at the internationally-famous Embry-Riddle Aeronautical Institute. After classes they will be enjoying themselves in this sunny, magical city, but their first consideration is a top-pay, secure career in aviation.

At Embry-Riddle's *Flight School,* modern planes carry students and instructors aloft as the former learn the intricacies of flying in the Executive Pilot, Business Pilot and Commercial Pilot courses.

In the laboratories other young men are preparing to take their places as *Aeronautical Engineering Associates* in just two short years.

Students from all over the world come to Embry-Riddle. It has a well deserved reputation among the aviation-minded as an accredited technical institute dedicated to *maximum training in minimum time.* Its emphasis on *meaningful* education and *specialized* training is geared to the demands of the aeronautical industry.

AIRFRAME AND POWERPLANT TECHNICIAN

(combined with COMMERCIAL PILOT training, if desired) is highly favored by young men who like to apply their minds and fingers to modern aircraft.

In this 16-month course, an Embry-Riddle student learns aerodynamics, the properties and strength of materials used in aircraft, engines and their components, and numerous other subjects. He acquires the knowledge and skills necessary to take apart, repair and reassemble an airplane. It's a direct step from classroom to payrolls.

Airframe and Powerplant Technicians are employed wherever aircraft are built and flown. Employment with commercial airlines offers opportunities for advancement to positions such as Flight Engineers. Many will operate the maintenance

facilities for local airports, or their own maintenance service for private and business owned aircraft.

EXECUTIVE PILOT

Pilots of business-owned aircraft belong to the respected and well-paid "aristocracy" of aviation. Embry-Riddle's new and exclusive 2-year EXECUTIVE PILOT course is fully endorsed by top-rated corporations. It prepares for pilot or co-pilot positions with appropriate C.A.A. licenses, including Commercial Pilot with Instrument rating and optional Multi-Engine rating, plus Airframe and Powerplant Technician certification.

BUSINESS PILOT

Students of this 4-year BBA degree course (in conjunction with the University of Miami) graduate as fully competent pilots with a sound background in basic business and management studies. Their certificate in Business Piloting includes the Commercial Pilot license with Instrument rating and optional Multi-Engine rating. Opportunities await in a variety of high-salaried positions.

Embry-Riddle's Placement Service and an alumni of thousands are helpful assets in giving graduates a QUICK START IN AVIATION.

FREE! 48-PAGE PICTORIAL BOOK

Send for it now. The few seconds you take to fill out the coupon might well shape your entire future.

Forty modern aircraft at Embry-Riddle Flight School.

AN ACCREDITED TECHNICAL INSTITUTE

Embry Riddle

AERONAUTICAL INSTITUTE

DIRECTOR OF ADMISSIONS
Embry-Riddle Aeronautical Institute
Dep't. D. Aviation Building
Miami 52, Florida

I want to investigate a well-paying career in the Aviation industry. Please send me background material on world-famous E-R training.

Print Name _____

Address _____

City _____ State _____

Age _____ ☐ Vet ☐ Non-Vet

I want to make my future in:

- ☐ Aeronautical Engineering Technology
- ☐ Airframe & Powerplant Technician
- ☐ A & P Combined with Commercial Pilot
- ☐ Business Pilot (with University of Miami)
- ☐ Executive Pilot
- ☐ Commercial Pilot
- ☐ Instrument Pilot

I'm thankful it's a Hartzell Propeller because it won't cost a fortune for new blades.

Hartzell COVERS THE FIELD

Hartzell Propellers are **far less** costly to maintain because the blades can be replaced at about half the cost as for other propellers. This is because the blade retaining hardware is removable.

Other famous Hartzell products include a complete line of industrial ventilating equipment, cooling tower fans, crop dryers and farm ventilating fans.

Hartzell PROPELLER, INC.
PIQUA, OHIO, U.S.A.
HARTZELL

GENUINE NAVY INTERMEDIATE PILOT JACKET

Brand new Genuine dark brown Goatskin leather with zippered front. Bi-swing back, two patch pockets, one inside snap pocket. Mouton fur collar. Rayon lined. 100% wool cuffs and waistband. The finest jacket made.

SIZES
34 to 46
$32.50
48 and 50
$35.00
State Size Wanted

U. S. N. ISSUE

A2 ARMY FLIGHT JACKET, select dark brown goatskin leather, brown rayon lined, zippered, elastic knit waistband and cuffs, 36 to 46, **$19.75,** 48 and 50, **$21.75.**

U. S. AIR FORCE K2A FLYING SUITS, blue nylon, lightweight, 8 zippers, give chest, height and weight measurements. **$10.95.**

U. S. AIR FORCE K2B FLYING SUITS, sage green cotton byrd cloth, latest issue, give chest, height and weight measurements. **$18.25.**

Shipped ppd. if remittance accompanies order.

Distributors of tires, batteries, aircraft parts and equipment

FLYING EQUIPMENT SALES CO.
Dept.F-32
1639-45 W. Wolfram St. Chicago 13, Ill.

New Cross-Country
FAA EXAM PRIMER
(PRIVATE AND COMMERCIAL)

233 Sample Exam. Questions explained and analyzed.

FROM
The Ground Up
"THE STUDENT'S BIBLE"

a **COMPLETE** Ground School Manual in **ONE VOLUME**

Fully covers
AIRMANSHIP · THEORY OF FLIGHT · METEOROLOGY · RADIO AIDS · AERO ENGINES · AIRFRAMES · NAVIGATION · CONTROLLED VFR · EXAMINATION QUESTIONS

MORE THAN 63,000 COPIES HAVE BEEN SOLD

TRADE IN your old manual
Mail us your old copy of "FROM THE GROUND UP" (The front cover will do) and $4.50. We will mail you a brand new replacement (Eleventh Edition) postpaid.

ONLY $5.50 POSTPAID

AVIATION SERVICE CORP.
PORT CREDIT ONTARIO

(Continued from page 78)

before him the example of his fellow New Yorker, the citizen-soldier Theodore Roosevelt, and his Rough Riders. If Roosevelt could rally doughty volunteers on horseback, why could not Bolling rally them in airplanes?

In the writer's judgment this in itself merited Bolling a hero's memorial. Democracy can remain dynamic only so long as individuals willingly assume responsibility for national vision. And contrariwise, government is democratic only so long as there is place for the voice and action of individuals in matters of public welfare. "Let government do it" is the surest of all roads to tyranny. In any case, the civilian had convictions and devotedly threw himself into their promotion. He proceeded to form the First Aero Company of the New York Guard.

This proved a premature attempt. Bolling was not without private funds and influence but a great deal of money was needed and volunteer student pilots did not grow on bushes. However, the Aero Club of America helped and, by spring of 1916, the Hempstead meadow on Long Island was cluttered with a conglomeration of tents and hangars to service an assortment of planes including a Curtiss, a Sturtevant, a Thomas, a Sloane and an assortment of parts.

Meantime the Mexican Border trouble caused the Guard to be mobilized in June, of that year. Bolling's outfit reported to Mineola but despite the captain's efforts, could not be whipped into shape for federalized service. He frankly reported the facts to Gen. Leonard Wood, Commanding the Eastern Department of the Army, and each resigned his Guard Commission and disbanded his outfit.

This experience rather soured Bolling on the possibilities of National Guard aviation but did not diminish his conviction about the necessity for reserve air strength. Shortly, the breakdown of Army airplanes on the Mexican border hit the headlines and, as the months crept by, bringing the United States nearer and nearer to conflict, the War Department found itself in a dilemma. Regular army air strength was negligible. A reserve air force was imperative but there was no legal provision for it. The private citizen went to Washington and worked for its inclusion in the National Defense Act of 1916. The force was authorized and a budget of $13 million provided for its establishment. Now Bolling's fine legal mind authored the program and he himself organized the first reserve squadron. War was declared in April, 1917, and shortly Bolling was a reserve major with his squadron at Governor's Island preparing for overseas duty.

But Bolling was not to take them overseas. He was called to the War Department to draft legislative bills for the entire Air Service's program—an appropriation of $640 million dollars as the first bite. Shortly afterward he was designated to head a U. S. Aviation Mission to the Allied governments and given authority to consummate joint arrangements for the Aircraft Production Board and the Army Air Service, for Allied equipment. His report was the foundation stone of subse-

quent Production Board action.

When the Bolling Mission arrived in Europe, engine and aircraft designers of the combatant powers, even with their head start in research and with first hand combat history to guide them, were sweating out every added mile of speed and every extra foot of altitude that could be contrived. Neither Germans nor Allies had been able to achieve a clean-cut aircraft performance superiority over the other. What chance then did American manufacturers have to crash this field? Moreover there was a decided difference between a theoretically superior airplane and one that was practical for combat. This was as embarrassing as Sputnik to face, but Bolling faced it. He had nothing on his mind to save but the country.

Instead of returning home with his Mission, Bolling was retained in France to organize procurement, training and administration of air components which were arriving as part of the expeditionary force. He now had the temporary rank of Colonel and his title was Assistant Chief of the Air Service, A.E.F. In the autumn of 1917, his status changed again and, as near as I ever knew, his subsequent activity, minus administrative duty, was concerned with Allied liaison and study of combat operations. Presumably he was anticipating field command.

In the spring of 1918—late March or early April—rumors began to drift around that Colonel Bolling was missing; but definite word of his whereabouts seemed impossible to pin down. Some time later it was ascertained that he had gone forward to visit airfields in the area of the Somme and, finding them overrun by the current German advance, had probed too far ahead and been killed in a gun battle. The American driver of his vehicle survived the ordeal and made report of his colonel's death.

The naming of Bolling Field lost nothing by the fact that a young temporary colonel, H. H. (Hap) Arnold, opportunely happened to be stationed in Washington as Assistant Director of Military Aeronautics. Arnold, later to become the father of modern airpower, clearly understood that he had a selling job. It was extremely practical to think that, with an airport and airplanes on hand, the Air Service would have opportunities to make high officials more air conscious. Even getting them accustomed to seeing aircraft in the skies and to watching them take off and land without ensuing disaster was an advantage not to be discounted.

When Bolling was killed in France, the air exponents had a 20-carat hero via whom to focus official and public attention on aviation. Everybody loves a hero.

The service of heroes does not end with death, so Bolling Field—old Anacostia Flats—although still uncompleted in mid-1918, was dedicated to hero citizen-soldier Bolling.

The colonel never shot down an enemy plane and was not a great pilot. He died in a pistol duel afoot while blundering around where an airman probably had no business to be. Yet he was an authentic hero—intellectually and physically. Bolling Air Force Base is well and truly named. END

NOW $90 Buys the Basic Oxygen Unit for Your Aircraft

Use this New Puritan Oxygen Unit

- As a Portable Unit
- As a Permanent Installation in Your Airplane — Designed to Your Specifications

Now, you can buy the type of assembly that is best suited to your specific needs. This basic unit, which costs $90, less cylinder, consists of the following: one adjustable two-stage flow regulator; cylinder connection for attachment to aircraft oxygen cylinder (1800 lbs. pressure); two outlet valves; two pieces of plastic tubing; one dozen Puritan disposable plastic masks.

You may quickly and easily adapt this basic equipment to meet your own individual requirements. (Add more outlets and plug-ins for the capacity you desire.) You use only safer, low pressures since regulator attaches to cylinder, and pressure is reduced from here on. Oxygen is supplied from cylinders, in the size you need, available at your aircraft distributor—or use lower cost medical cylinders available from Puritan.

THIS PURITAN EQUIPMENT NOW IN USE ON THE WORLD'S FINEST AIRLINES

After years of use aboard many major domestic, international and foreign air carriers, Puritan airborne oxygen equipment has been judged "tops." The Puritan disposable mask—the same one developed to meet rigid hospital standards—is now available to the aviation field for the first time.

Aviation Division PURITAN MAID

WRITE TODAY FOR COMPLETE DETAILS ON HOW TO ORDER YOUR PURITAN AIRBORNE OXYGEN EQUIPMENT

Puritan SINCE 1913

COMPRESSED GAS CORPORATION
2012 GRAND AVENUE, KANSAS CITY 8, MO.

PIONEER MANUFACTURER OF AVIATION OXYGEN BREATHING EQUIPMENT

WE PAY MORE for your airplane MAKE US PROVE IT!

• INSTANT CASH •

PHONE WRITE WIRE

JACK DANIELS AIRCRAFT

P.O. Box 811
Municipal Airport
Longmont, Colorado
Phone Prospect 6-1454

only 15c for this authoritative guide to building an inexpensive record library!

reprinted from HiFi REVIEW

Now—you can build a record library of hi-fi classics from the steadily growing catalogue of $1.98 releases! More than half a dozen big record companies are re-issuing great performances on the new $1.98 labels. You can have a guide to the best of these for 15¢—by ordering this reprint of a recent article in HiFi REVIEW. Complete with catalogue number, artist, orchestra and conductor information—it's a fabulous guide to building up a high fidelity library of basic classics!

In addition, HiFi REVIEW's Music Editor, David Hall, gives you the background of the $1.98 market . . . evaluates the discs being offered at this price . . . pinpoints the future of high-quality, low-price records.

If you've been thinking of starting a record collection or adding to the one you have—this reprint is your best guide! Order your copy today—simply mail 15¢ in coin or stamps with the coupon below. But the supply is limited, so order now!

HiFi REVIEW **F89**
Box 1778R
Church Street Station
New York 8, N. Y.

Please rush my copy of the HiFi REVIEW reprint on building a library of $1.98 records. I enclose 15¢ to cover postage and handling.

Name _____

Address _____

City **Zone** **State** _____

Call Me Pantless

(Continued from page 40)

the air, audience and sheep mingled on the field. The Standard made a few circles of the village nearby, as the pilot coaxed the altimeter to 1,500 feet. Then as the plane slowed down to squash across the field, O'Timmons rolled off the catwalk, fell free some 500 feet and pulled the ripcord. He shouted for the crowd to clear the field. The people responded but the sheep kept right on milling around. O'Timmons landed astride one. It bleated in a frenzy of fear and took off. Following it, at least a score of others dashed over the prostrate figure of Smiles and his brand new parachute.

The crowd was so convulsed with laughter at the performance that the enterprising O'Timmons actually took up a second collection, which exceeded the initial passing of the hat. I lost no time in signing him for a series of air shows which I was staging in the middle Atlantic states.

Smiles showed up early for the first date. By the time I got around to him, he was squatting in the field instructing two gas truck drivers how to pack his parachute. To my amazement, I learned that the Irvin, on previous occasions had been packed successfully by practically everyone from rest room attendants to hotel bellboys. On many future occasions, I found it my duty to assist with the packing chore.

O'Timmons, handicapped as he was, could never quite control his parachute after it opened. As a result, he landed in swamps, on housetops and once on the wingtip of a taxiing airplane. After that, we permitted no airplane engines to be turning over while Smiles was doing his act.

Our air show pilots got almost as many thrills as our audiences every time O'Timmons took to the sky. After awhile, he learned to climb in and out of a cockpit, despite the bulky pack on his back. This was no easy chore but what Smiles lacked in limbs, he more than made up with strength. With one hand, he could chin himself time after time and because of this, he learned to lift his body from the cockpit with ease.

Smiles staged a performance that had me guessing during our last show of the 1927 season. It was to be a big payoff day before we headed south to Miami. There wasn't a cloud in the autumn sky as I drove to the airport to see that everything was in readiness for the program. By the time I reached there, the planes were being fueled; the refreshment stands were being stocked and O'Timmons had two early spectators, lining up the shroudlines of his parachute. There was only one fly in the ointment. Our wing-walker was laid up. We had no one to do the wing-walking act—that is, until O'Timmons volunteered.

By noontime, the field was filled with spectators and automobiles. The refreshment stands were selling pop that had been on ice less than five minutes and concession men were running back and forth to town to buy up anything that could be ground into hamburgers. Our

Aviation... NEEDS YOU!!

IMMEDIATE ENROLLMENT IN C. A. A. CERTIFIED CAREERS

MECHANIC TRAINING

FLIGHT TRAINING

COMPLETE INSTRUCTION IN ALL PHASES
DAY OR EVENING CLASSES
V. A. Approved • Free Job Placement

TETERBORO SCHOOL OF AERONAUTICS
TETERBORO AIRPORT, TETERBORO, N. J.
PHONE: ATlas 8-1880

AIR FORCE FLIGHT CLOTHING & EQUIPMENT

NOW AVAILABLE
NEW AF L2B GENUINE LT. WT. SAGE GREEN NYLON FLIGHT JACKET WITH KNIT COLLAR
Not a copy—AF Issue...$18.95

AF P-1 FLYING CRASH HELMET WHITE, CHINSTRAP & EARPHONES
NEW—NO VISOR $22.50
USED—W/SUN VISOR 15.95

L2B REG. SAGE GR. NYLON FLIGHT JACKET 12.95
AF 2-MAN RUBBER LIFE RAFT YELLOW..... 29.95
w/Seat & 2 Paddles—Guar. Seaworthy—Post. 1.00

AF REISSUES
K2B SAGE GR. COTTON FLYING COVERALL... 4.95
L2A-B BLUE or SAGE KNIT COLLAR JACKET... 7.95
B4B SAGE GREEN NYLON UNIFORM BAG..... 6.95
USN GOLD COLOR JET PILOT CRASH HELMET.. 7.95

Your Inquiries Are Invited
Satisfaction Guaranteed—Enclose 50¢ for Mailing

DAVE'S ARMY & NAVY STORE
Serving the Armed Forces
1404 W. SUSQUEHANNA AVE.
DEPT. B2 PHILA. 21, PENNA. DEPT. B2

CESSNA OWNERS WE HAVE YOUR
TOUCH-UP PAINT
STATE YEAR & COLOR $1.00 EACH POST PD.
MOHS SEAPLANE COMPANY
2355 UNIVERSITY, MADISON, WIS.

Now Available!
JARDUR Precision-Built, Water-Resistant, Aviation Chronographs and Wrist Watches.
At Your Local Dealer
Catalog Sent on Request
JARDUR IMPORT CO., 874 B'way, New York 3, N.Y.

passenger planes were busy right up to the time we loaded every cockpit for the traditional air parade over the city, to mark the opening of the show.

Once back on the field with all planes on the parking line, we got under way with our deadstick and spot landings, bomb-dropping and stunt flying. Then, via megaphone, I announced the wing-walking act, featuring Smiles O'Timmons, with Bob Clohecy at the controls of an OX-5 Jenny. The crowd pressed closer as Smiles mounted the speaker's platform to give his pitch for the collection.

Clohecy taxied the Jenny up to the platform and O'Timmons climbed aboard. He swing easily into the cockpit and waved to the audience as the lumbering JN4 rambled down the field for take-off. It was a hot day and the OX-5 groaned in its effort to turn up 1,360 revs. Finally, the plane turned into the wind and set out, parallel to the Lincoln highway and using every available inch of sod before the rubber cleared the tall grass.

The Jenny climbed slowly and on that occasion appeared to climb even more slowly than usual. We watched the plane maintain a steady heading until it was lost behind a distant hill. It was fully 15 minutes later that we saw the ship again. This time, it was approaching from the north and at an altitude of approximately 1,500 feet. As the Jenny approached the field, we could see Smiles emerge from the cockpit and feel his way forward to the point where he was standing on the leading edge of the lower wing and then making his way in the direction of the left wing tip. Then O'Timmons was lost from our view as the Jenny barged above our heads, heading south and making a gentle turn.

When the plane again approached the field, Smiles was standing at the front inner bay strut, holding to the rigging with the stump of his left arm and waving with his right. The audience shouted with glee as O'Timmons maintained his hold, now using his good hand and permitting his good leg to wave in the breeze. The third time across the field, I smelled trouble, and I was right. To build up the act, I shouted my fears to the audience. I knew that something was wrong—but I didn't have any idea of what it might be.

Time after time, the plane crossed above us and each time at a lower altitude. O'Timmons was no longer waving to the crowd or even paying any attention to the ground below. He had a bigger problem on his hands. The last time the Jenny crossed the field, it was downwind and at an altitude of only 500 feet. This was certainly not copacetic so far as our air show plans were concerned but there was nothing anyone could do about it.

If you ever watched a Jenny making a flat turn at 500 feet, and were aware that it was sheer suicide, you will sympathize with my feelings at the moment. To this day, no one knows what unseen power kept old bucket of bolts from whipping into a spin but we do know that after what appeared to be a hundred years, it headed back toward the field and Smiles O'Timmons was not standing on the wing. In his place, stood some still unrecogniz-

(Continued on page 84)

AIRTEX replacement cushion sets, headliners, wallpanels, carpets recover envelopes, recovering supplies, dope—can make your plane like new again.. Everything made so that you can DO-IT-YOURSELF! Write for AIRTEX catalog today; mention make and model of your plane.

Airtex Products 105-109 E. BRIDGE STREET MORRISVILLE, PA.

PILOTS INCREASE YOUR EARNING POWER

INSTRUMENT
An Instrument Rating is a MUST for all Airline Co-Pilots, Business Pilots and Anyone making extended Cross Country Flights.

COMMERCIAL PILOTS COURSE
Present tremendous demand for Airline and Executive Pilots has depleted supply of qualified Pilots — A Commercial Certificate is the first step toward an aviation career.

AIRLINE TRANSPORT
Necessary for all Airline Captains — Many Companies require all their Pilots to hold this Rating. Single engine and Lockhead, Aero Commander and Douglas DC-3 Multi-engine equipment are available.

TYPE RATING
Available to holders of ATR's who want a Type Rating added to their Ratings. Lockhead, Aero Commander and Douglas DC-3's available.

COMPANY PILOT REFRESHER
Single engine and Multi-engine Lockhead, Aero Commander and Douglas DC-3 available for this course, which is fitted to the needs of each Company Pilot.

MULTI-ENGINE
Lockhead and Douglas DC-3's used for this course.

INSTRUCTOR
Increasing demand now is for Pilots holding Instructor Ratings, BOTH Flight Instructor and Instrument Flight Instructor.

A Complete Ground School Furnished With All Courses

Get Your INSTRUMENT and AIRLINE TRANSPORT RATING NOW...

Train at American Flyers — the world's largest Instrument and Airline Transport Flying School — and insure your future in aviation. American Flyers has trained more pilots for the airlines than any other school in the country — MORE THAN ALL OTHER SCHOOLS COMBINED!

VETERANS — All you need to enroll in any of these courses is a Certificate of Eligibility from the Veterans Administration approving you for the courses you desire. Courses start every Monday morning — no waiting.

AMERICAN FLYERS INCORPORATED

Meacham Field, Ft. Worth, Tex.

MAIL THIS COUPON TODAY

☐ INSTRUMENT ☐ COMPANY PILOT
☐ AIRLINE TRANSPORT ☐ MULTI-ENGINE
☐ COMMERCIAL ☐ INSTRUCTOR
☐ TYPE RATING ☐ VETERAN ☐ CIVILIAN

REED PIGMAN, AMERICAN FLYERS, F2
Meacham Field, Fort Worth 6, Texas
Please send me FREE Booklet and data on Courses checked —

NAME_____

STREET_____

CITY_____ STATE_____

(Continued from page 83)

able object. Then, as the Jenny nosed into a gentle glide for an almost perfect landing, I recognized the object to be O'Timmons' artificial leg. As for Smiles—he was riding high in the front cockpit.

Only after the Jenny was on the ground and Clohecy had taxied to the parking line, did the crowd press in to learn what had happened. O'Timmons tried in vain to have the crowd move back but there were hardy souls who mounted the wing catwalk and peered into the front cockpit. They were the first to learn that O'Timmons had not only lost his artificial leg—he had also lost his pants. Someone volunteered with a suit of coveralls and Smiles emerged from the cockpit to retrieve his leg standing on the leading edge of the lower wing.

Clohecy explained what had happened. While O'Timmons was walking along the leading edge, the heel of his artificial leg had broken through the fabric and become wedged between two false nose ribs. As the daredevil battled to free himself, the plane lost power and altitude. Clohecy faced a forced landing with O'Timmons standing out there on the wing. During the last 500 feet of the descent, O'Timmons, by almost superhuman strength, managed to break the leather shoulder strap attached to his leg. Then, employing his knowledge of gymnastics and contortion, he wriggled himself free from both leg and pants and got back into the cockpit while Clohecy sweated out the landing.

A few minutes later, O'Timmons was back on the speaker's platform, to greet the crowd—and take up another collection for his forthcoming parachute jump. "You just can't find them like that any more!" END

"My husband's day is brightened if he can outguess the radio weather forecaster."

NEW Aero RADIO GUIDE

A NEW CONCEPT in the organization of vital radio and airport information available now with essential facts for VFR and Instrument flight conditions. Contains all Omni stations, LF radio aids and broadcasting stations for ADF plus information for all civil airports with control towers or ILS. See magnified portion for wealth of material conveniently arranged for WAC and keyed for use with Sectional charts. Radio Guide fills in the missing data you need for easier and safer flying. Monthly revisions give you changed frequencies, new stations, etc. At your airport. Where not yet available, order by mail with 7 day refund guarantee.

PLUS General Information and Handy 'Magic Slate'

PLUS All Civil Airports Having Control Tower or ILS

WITH Omni Low Frequency and ADF Facilities

* Covers entire Mid-Continent U.S. keyed to all 87 Sectionals, 43 WAC

COMPLETE WITH MONTHLY REVISION SERVICE FOR ONE YEAR. $12.00 Per Year Renewal.

Your name imprinted on cover in Gold $1.00 addt'l.

$19.95 ppd.

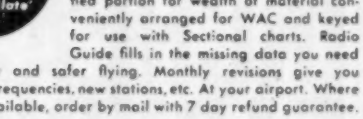
AERO PRODUCTS, ST. CHARLES, ILLINOIS

GRAUBART Has just about everything in fine used EXECUTIVE AIRCRAFT

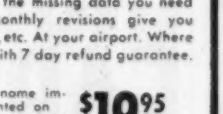
AIRCRAFT BASED AT PORTER CO. AIRPORT VALPARISO, INDIANA | MOhawk 4-6260

GRAUBART AVIATION INC.

PRUDENTIAL PLAZA CHICAGO 1, ILL.



BIG or SMALL they all SHINE BEST SHINE LONGER SHINE EASIER with



NEVR-DULL Aluminum Cleaner and Polish

The original chemically-impregnated cotton wadding — Cleans quicker, gives higher, longer-lasting gloss, leaves protective film. Saves time, labor and money! Avoid inferior imitations.

AVAILABLE AT LEADING DISTRIBUTORS

MANUFACTURED EXCLUSIVELY BY George BASCH Co.

19 Hanse Avenue, Freeport, L. I., N. Y.

Operation Horselift

(Continued from page 50)

was injecting Equizol, a potent anesthetic designed especially for horses, into her bloodstream. She lay down gently on her side but suddenly, panicky at the strange numbness creeping over her, turned from a gentle creature into a veritable monster. A shudder slid down my spine as I pictured this demon thrashing around in my airplane. However, after a few moments of panic, Nebu gave in to the insidious power of the chloral hydrate, and with one last sigh, collapsed in sleep. With our block and tackle, plus a set of rollers we had borrowed from a brewery, and some mighty heave-hoing, we got our dormant cargo eased aboard.

I taxied slowly to the end of the short field, blasted the tail around and, after one last look at my slumbering passenger, poured the coal to the big Wright. Slowly the old biplane mushed through the clinging snow, its bellowing seeming to fill the entire canyon. I rocked the wings desperately, trying to break the drag of the skis. A mental "ten feet more and I'll have to chop the power," when suddenly, riding the tremendous ground cushion of the lower wings, we staggered into the air. Free from the clutching of the snow, we had it made, and the white wilderness slid away beneath the yellow wings.

The trip out was an anti-climax—an occasional horsey groan through the cabin, an occasional shudder in the controls as Nebu shifted in her sleep. The entire populace of Cascade was on hand to greet us as we slid to a stop. Eager hands eased the brown mare to the ground, and minutes later in a pile of straw . . . she was sleeping off her first "hang-over."

Now we had a system and the remaining three horses were shuttled out uneventfully.

The pink and gold of the winter sunset was fading to darkness as I put my old Cunningham away for the night. Four contented horses were munching hay in the corner of the hangar. I stood to watch them and felt good. I had stood between them and death by freezing or by starvation or by Ben's merciful rifle. But the wolves wouldn't be gnawing on them this winter. Next spring they would be on the trails again. I wondered if they would look up as the Cunningham crossed Sulphur Creek on one of its myriad chores. In any case, I'd always have an interest in them. I could hear myself asking Mr. Morgan, "How are those horses getting along, Ben?"

It's things like this that a "busher" lives on. Sometimes when I tend to get a little envious of the boys cruising overhead "above the weather," I remember such incidents and forget to be envious. Somebody has to fly in the weather for that's where horses—and people—usually need help. It's a good feeling to be needed. END

IT COMES HIGH

Airline jet flight training costs approximately $2,000 per hour.

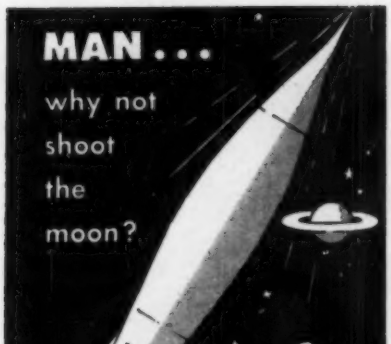
"Certainly, I'm available! But, sir, you don't need an explorer to locate Southwest Airmotive's five convenient parts warehouses. Anyone can find Dallas, Houston, St. Louis, Kansas City and Denver."
SOUTHWEST AIRMOTIVE CO., LOVE FIELD, DALLAS
Parts Distribution Outlets: Dallas, Houston, St. Louis, Kansas City, Denver.
Aircraft Sales Company: Ft. Worth and Longview, Texas

THE NEW "SKY GEM"

The Sky Gem is now in production. It is tops in performance. Competitively priced. Cruises at 185 MPH or more with a 205 HP Continental engine. An all metal, four passenger plane.

Dealers wanted. Write for details.

GEM AIRCRAFT, INC.
Rexburg, Idaho



Nothing is impossible!
The success you desire
can be yours.

YESTERDAY'S FANTASY,
Today's Reality!

Space Ships, Outer World Satellites, these are subjects of common conversation today—they were utterly fantastic ideas just a few years ago—and in the near future they will be as commonplace as the airplane is today.

WHO'S RESPONSIBLE?
The Engineer and the Scientist

We here at Northrop Institute are proud of our many graduates who are part of today's "shoot the moon" thinking. These men are happy and successful in their engineering careers . . . in the fantastic world of aviation, electronics, missiles, and space science.

WHY NOT YOU?

You can join these successful graduates after just two short years of technological education at Northrop Institute—or, if you elect, you may continue your study for an additional year and earn a **Bachelor of Science Degree** in the fields of Aeronautical Engineering, Electronics Engineering, or Aircraft Maintenance Engineering. Approved for Veterans.

Northrop Institute of Technology
(Northrop Aeronautical Institute)
1119 W. Arbor Vitae Street
Inglewood 1, California

NORTHROP INSTITUTE OF TECHNOLOGY
1119 W. Arbor Vitae Street, Inglewood 1, Calif.
Please send me immediately the Northrop catalog, employment data, and schedule of class starting dates. I am interested in:
☐ Aeronautical Engineering Technology
☐ Electronic Engineering Technology
☐ Aircraft Maintenance Engineering Technology
☐ Airframe and Powerplant Mechanic
☐ Jet Engine Overhaul and Maintenance
Name..... Age....
Address .....
City..... Zone .. State.....
Veterans: Check here ☐ for Special Veteran Training Information.

Altitudes

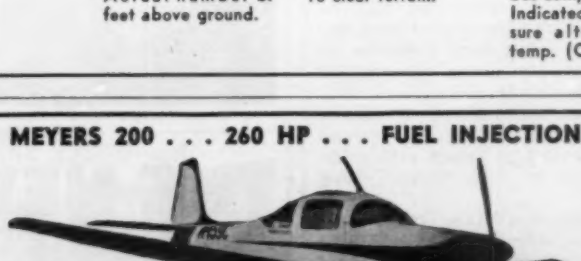
(Continued from page 39)

mercury from the control tower, or when you reset your altimeter while in flight in accordance with the setting broadcast by the nearest ground station. (If you are equipped with radio you should reset your altimeter according to these broadcasts, especially on a long cross-country flight.) This *indicated* altitude setting is determined on the ground. It is found simply by setting an altimeter to field elevation and reading off the pressure from the pressure window. At this place and time it is true altitude, sure enough. But it may be a different story in the air, because as we already know, the pressure and/or temperature may not decrease according to Hoyle as you go up. Then too, both of these factors may be changing, and an "altimeter setting" that was good when you took off may be invalid an hour later. Even so, the indicated altitude has several important uses. It is needed for figuring true altitude; it actually is the true altitude at field elevation, so it can be used for instrument approaches; and it is the altitude used by all pilots flying along airways, because although it may not be the true altitude, it is at least the same altitude for all planes in the same area and thereby provides a safe standard for vertical separation. It might seem that pressure altitude would be simpler for providing vertical separation, but then your altimeter wouldn't indicate field elevation when you touched down or the proper altitude for approaches and traffic patterns. True altitude would be fine, but it wouldn't be as easy to find due to the need for constant computer work, and besides, at traffic pattern and approach elevations it wouldn't be likely to differ more than a few feet from the indicated altitude. Only when you get up several thousand feet can there be a real difference between true altitude and indicated altitude. To help you remember which altitude is which, there is a summary chart at the end of this article.

In practice then, you start off your flight with indicated altitude, and you fly the airways and gauges on indicated altitude. You figure your airspeed by using pressure altitude, you determine your clearance over terrain by computing your true altitude, and you figure your plane's flight performance on the basis of density altitude. Each of these altitudes has a different purpose and meaning. As a good pilot you should be concerned with your altitudes, particularly while flying cross-country, just as you should be constantly keeping tab on weather and navigation. You may be able to fly in ignorance of all these things until your long white beard gets in the way of the controls, but it is a lot more likely that, if you know what you're doing and how high you're flying, you'll fly longer and safer. END

Name	Definition	Use	How to Find
Pressure Alt.	The altitude that would exist under standard pressure conditions.	To find AS, Density alt., True alt. or horsepower.	Set altimeter at 29.92.
Density Alt.	An altitude that corresponds to a given density in a standard atmosphere.	To determine performance.	Correct press. alt. for temp. use Computer.
Indicated Alt.	Altitude corrected for pressure & temp. at station, but not at flight altitude.	For traffic separation, instrument approaches, & finding true alt.	On ground: set altimeter to field elevation. In air; ask tower or listen to report from nearest ground station.
True Alt.	Actual number of feet above ground.	To clear terrain.	Use computer. Need: Indicated alt., pressure alt., and air temp. (C).

MEYERS 200 . . . 260 HP . . . FUEL INJECTION



The new Meyers 200A is now in production. With the new engine, we are offering increased speed and even increased economy, while retaining the same exceptionally brilliant handling, and performance characteristics, for which Meyers airplanes have been well known for 22 years. It is the FASTEST, AND SAFEST BUSINESS AIRPLANE OF ITS CLASSIFICATION IN THE SKIES. This four passenger aircraft has a cruising speed of 204 mph. plus . . . Lands at 55 mph. . . . and has a range of 1300 miles. It is aerodynamically stable, and of all metal construction. Its gross weight is 1919, and total fuel capacity is 82 U. S. gallons.

WRITE TODAY FOR DETAILS. **DEALER INQUIRIES INVITED.**

MEYERS AIRCRAFT CO. • Tecumseh, Michigan
Designers and Manufacturers of precision built aircraft since 1937

Cape Cod

(Continued from page 42)

Cod Bay into Plymouth Harbor.

The yachtsman can cruise the Cape and island neighbors, making port almost anywhere along the 300 miles of shoreline. The landsman can reach its inviting towns and beaches by modern highways. And the airman? His needs too are exceptionally well cared for. He has no less than seven airports and one seaplane base on the Cape itself to select from—three on Martha's Vineyard and one on Nantucket. (See detailed listing on page 88.) Plymouth and New Bedford, Mass., both provide modern airports and are good mainland ports for take-off to the islands and Cape points, aside from their own individual attractions for the visitor's interest.

A word to the unwary. Be sure you are weatherwise, for this area, particularly in mid-summer months, is subject to fog conditions which arise with incredible speed. Some of the best flying months for the Cape region, according to the Massachusetts Aeronautics Commission, are September and October. A consideration, too, is that prices then are considerably more reasonable than those which prevail during the height of the summer season.

Cape Cod is at the southeastern end of Massachusetts. Its natives, warm, informal and disliking ostentation, make up one of the last strongholds of "rugged individualism" and among them are some of the saltiest of all American types. They call it "having salt in our shoes." The name stems back to about 1602 when first visited by the English explorer Bartholomew Gosnold. Legend has it that his ship's crew caught so many cod fish that the name Cape Cod was then born. Sparsely settled for many generations, its permanent population today is about 46,000, with summer visitors swelling the number by many thousands.

On the Cape and neighboring Martha's Vineyard and Nantucket Islands are practically unlimited vacation facilities—by far too many to cover fully in this space. For details on hotels and resort facilities, address Cape Cod Chamber of Commerce, Hyannis, Mass., or New England Council, 1032 Statler Office Bldg., Boston. For Nantucket: Nantucket Island Chamber of Commerce and the Vineyard: Chamber of Commerce, Vineyard Haven—or if you have access to the American Automobile Association's Northeastern Tour Book, you will find a great deal of data.

However, a few introductions to what one may expect within easy reach of the airports serving this holiday route will give some pretty good leads.

Let's begin with Plymouth. Here are many historic interests, such as The Rock, Plimoth Plantation and a replica of the first Mayflower. A Pilgrim Trail with directional signs guides the visitor to all points of historic interest. Accommodations as at all other points are attractive and plentiful, as are restaurants. Recreation includes fresh and salt-water fishing, boating, swimming, hunting of upland game, deer, duck and pheasant in season.

On the south shore of the Cape is Fal-

(Continued on page 88)

CAA EXAM AIDS

NEW - JUST REVISED!

INCLUDES NEW OPEN BOOK EXAMS
NAVIGATION AND METEOROLOGY
MAPS INCLUDED
FREE!

A Ross Questionnaire FOR EVERY CAA RATING
COMMERCIAL PILOT QUESTIONNAIRE
FLIGHT INSTRUCTORS QUESTIONNAIRE
Only $5.00 EACH

The EXAMS in Ross Questionnaires are typical of the very latest CAA questions. Constant revision of our books assure you getting the latest possible material. Use Ross Questionnaires to prepare for your CAA ratings and you'll save time, effort and money. Order today, money back guarantee, mail coupon below now!

CUT OUT AND MAIL

☐ Payment enclosed, ship postpaid.
☐ Send C.O.D.

☐ Private Pilot	$5.00	☐ Instrument Instructor	$5.00
☐ Commercial Pilot	$5.00	☐ Airframe Mechanic	$5.00
☐ Instrument Pilot	$5.00	☐ Power Plant Mech.	$5.00
☐ Flight Instructor	$5.00	☐ Flight Engineer	$5.00
☐ Airline Trans. Pilot	$5.00	☐ C.A.R. for Pilots & Mech.	$5.00

NAME _____
STREET _____
CITY _____ STATE _____

SPECIAL NOTICE!

Would you like a complete Ross Aviation Library, consisting of all 10 Ross Aeronautical Questionnaires shown here? If so, we offer the complete set at a special price of . . .

$25.00

☐ Check here for this 10 book Special Offer.

ROSS AERO PUBLISHERS
BOX 8098-M • MUNICIPAL AIRPORT • TULSA, OKLAHOMA

FLIGHT TRAINING IN A HURRY!

BIG PAYING JOBS NOW OPEN FOR YOU!
TRAIN IN 31 AIRPLANES - 16 FLIGHT SIMULATORS

ROSS AVIATION OFFERS YOU:

- Only Nation-Wide flight school in the U. S.
- 3 Convenient locations, east-coast, midwest, west-coast.
- Free placement service.
- Largest supplier of pilots to the nations airlines.
- Only flight school in U. S. using fully automatic link trainers.
- Ground school and Flight school.
- Operates seven days a week.
- CAA examiners on staff.
- VA and CAA approved.
- Courses start every Monday, no waiting.

There are many big paying jobs in aviation today, waiting for you . . . if you can qualify! Personalized instruction can get you those CAA ratings immediately and those high paying jobs can be yours! Let us know today what courses you would like and we'll advise in detail by return mail, how Ross Aviation can help you. Ross Aviation is nationally recognized as the largest supplier of trained pilots to the airline companies of the nation.

CAA EXAMINERS ON STAFF

ROSS
SCHOOL OF AVIATION
TULSA, OKLAHOMA

MAIL TODAY!

ROSS SCHOOL OF AVIATION
Box 8098-L, Municipal Airport, Tulsa, Oklahoma
You bet I'm interested. Without obligation, please send me FREE information on the courses checked.

☐ Instrument	☐ Commercial
☐ Airline Transport	☐ Flight Instructor
☐ Multi-Engine	☐ Link Instructor
☐ Flight Engineer	☐ A & E Mechanic

Name _____ Age _____
Your hours logged _____
Address _____
City _____ Zone _____ State _____

(Continued from page 87)

mouth, a large resort area with fishing, golf, tennis, sailing, Cross Right State and Falmouth Playhouses. At one time a whaling and shipbuilding center, it is seven miles from the Coonamessett Airport.

Hyannis (Barnstable Airport), hub of the Cape, is a major shopping center. Here, as at Woods Hole and New Bedford —if weather is socked in—one can take a boat to Martha's Vineyard and Nantucket. Here also is Craigville Beach, the largest on the Cape; fishing, sailing, water skiing, motor-boat rides, summer theater, music, circus, and hunting in season.

At Marston's Mills, you will find horseback riding, directly across the road from the airport parking area, and fresh water fishing in nearby Mystic Lake.

Chatham at the Cape's "elbow," with the Atlantic Ocean on one side and Nantucket Sound on the other, is focal point for some of the best surf-casting in the area. It is also famous for the Atwood House, Chatham Light and Monomoy Point, a national bird refuge. Sky Meadow Airport serves Orleans with its excellent beach and good shell fishing. Just beyond Orleans is Easthan and its famous old Nauset Light and Old Windmill, a Cape landmark. Wellfleet and Truro nearer to Provincetown are both worth touring.

Provincetown is the tourist's favorite. Its art colony, beaches, Historical museum and Pilgrim monument are among its outstanding attractions.

Moving back up the Cape along Cape Cod Bay, one comes to Dennis and East Dennis. Dennis is a fascinating old town known for its Cape Playhouse with its beautiful murals by Rockwell Kent and Jo Mielziner. Harwich, south of Dennis, is another small and early whaling center, now center of cranberry cultivation.

Sandwich near the Canal is famed for the early American Sandwich glass; Sagamore and Bourne on the Cape Cod Canal, are photographers' heaven and at Bourne is the Aptucxet Trading Post, a replica of the trading post which was built on the site in 1627. Wood's Hole where one gets the boat for the Vineyard and Nantucket Islands is site of the world-famous Oceanographic Institution and U. S. Marine Biological Laboratory for the study of tides, currents and marine life.

Duxbury, too, north above Plymouth belongs to history if for no other reason than because it was founded by Myles Standish and today visitors may go through the home that Myles Standish made for his Priscilla Alden. There is a State Park here too, beautiful homes and wide sandy beach. Other State camping sites are at East Brewster on the Cape and Whitney Woods near Cohasset.

In sum total Cape Cod is romantic, beautiful and replete with the meanings of history. One visit and you will go back time after time, get salt in your shoes, and stay for as long as your holidays permit.

AIRPORTS SERVING THE AREA

(Boston Sectional Aeronautical Chart)

Chatham (Municipal). 1.7 mi. WNW. Elev. 66 ft. Runway 6-24, paved, 2,500 ft. Beacon and runway lights (arrange by 'phone in advance). July, August, Sept. lights on all night. Unicom. (Arpt. hours

AMERICA'S LEADING INDEPENDENT UNDERWRITER OF PRIVATELY OWNED AND BUSINESS AIRCRAFT

INSURANCE BY NORTH AMERICA

Insurance Company of North America • Indemnity Insurance Company of North America
Life Insurance Company of North America • World Headquarters: Philadelphia

INA

ELIMINATE DYNAMOTOR TROUBLES

with LOW COST SIE TRANSISTORIZED POWER SUPPLIES

SIE TPC-18 (12 volt) and TPC-19 (24 volt) Power Supplies replace D-10A Aircraft dynamotors with a low drain source specifically designed to provide reliable power for use with communications and navigation equipment.

The absence of moving parts in SIE Power Supplies eliminates warmup . . . insures long life and freedom from environmental problems. The lightweight (1.1 lbs.) units are plugged-in in place of a dynamotor in seconds, and are fully protected against overload and shorts.

Distributorships available.

SOUTHWESTERN INDUSTRIAL ELECTRONICS COMPANY
A Division of Dresser Industries, Inc.

P. O. Box 13058
10201 Westheimer Rd.
Houston 19, Texas

SIE

AIRCRAFT OF THE 1914-1918 WAR

10 DAYS FREE TRIAL

BY TEMPORD, BIDWIG, & BUSSELL. CONTAINS 234 LARGE 11" x 9" PAGES OVER 200 WORLD WAR I AIRCRAFT. PRINTED ON GLOSS PAGES. 80 FULL PAGE DRAWINGS, 14 FULL PAGE SQUADRON PHOTOS, PLUS HUNDREDS OTHER PHOTOS OF EVERY PLANE IN BOOK. PLANES FROM U.S.A., ENGLAND, ITALY, FRANCE, GERMANY ETC. ARMAMENT, TYPE MOTOR, RATE OF CLIMB, SPEED ETC. FOR EACH PLANE GIVEN, PLUS "HISTORY" OF EACH INCLUDING RARE AND EXPERIMENTAL TYPES. OVER 80,000 WORDS IN TEXT. DELUXE BOUND. SEND PAYMENT IN FULL, IF NOT 100% SATISFIED, RETURN BOOK WITHIN 10 DAYS FOR A REFUND.

DELUXE BOUND COPY $11.95

SPECIAL

FULL PAGE SAMPLES OF BOOK ABOVE AND BOOK BELOW, PLUS LATEST BOOK CATALOGUE .25

"VON RICHTHOFEN AND THE FLYING CIRCUS"

BY H. J. NOWARRA, WHO SERVED WITH UDET DURING THE FIRST WORLD WAR. CONTAINS 208 LARGE 11" X 9" PAGES, ALL IN ENGLISH. COVERS ALL OF "VON RICHTHOFEN'S" 80 KILLS, PLUS THE STORY OF THE 200 BATTLE PILOTS THAT FLEW WITH HIM. OVER 200 RARE, MOSTLY NEVER BEFORE PUBLISHED PHOTOS OF HIS PLANES, PILOTS AND EQUIPMENT. ADDITIONAL TO STORY, THERE ARE A NEW TYPE 6 VIEW (YES 6 VIEW!) HIGHLY DETAILED SCALE DRAWINGS OF EVERY PLANE USED BY THE "RED BARON" AND HIS "CIRCUS". EACH COVERS A 2 PAGE SPREAD IN THE BOOK. THE PHOTOS AND PLANS ARE TRULY COLLECTORS ITEMS ALL THE BOOK ITSELF IS A DELUXE COLLECTORS PIECE, WEIGHS OVER 2 POUNDS. ALL PAGES OF HIGH GLOSS STOCK.

DELUXE BOUND COPY $11.95

"AIRCRAFT PAINTINGS"

FOUR BEAUTIFULLY MULTI COLORED LARGE 17" X 14" PAINTINGS SET, EACH OF FAMOUS W W I PLANES. THESE ARE "BRITISH S E 5" (AS SHOWN ABOVE) PLUS "GERMAN ALBATROSS"—"FRENCH SPAD" AND "GERMAN FOKKER D-7."

MULTI COLOR PAINTINGS $3.98

"PLANEBOOK"

OVER 1000 DIFFERENT WORLD WAR ONE AND TWO "MUSEUM TYPE" AND "FLYING TYPE" PLANES. OVER 160 PAGES.

PLANEBOOK $1.00

"THE IRON CROSS"

IRON CROSS, AS WORN BY GERMAN "FLYING CIRCUS ACES." EACH HAS SILVER OUTER BORDER, BLACK CENTER SECTION, DATED 1914.

CROSS $4.98

ADD 25c FOR SHIPPING COSTS TO EACH ITEM THAT YOU ORDER.

GULL MODEL AIRPLANE COMPANY
10 EAST OVERLEA AVE. DEPT. G BALTIMORE 6, MARYLAND

only.) Services: storage, major and minor repairs. Gas: 80-91-100 oct. Taxi, courtesy cars, restaurant. Wilfred Berube, Mgr. Tel. Chatham 8677.

Chatham (Seaplane base) 1.7 mi WNW. 1 lane, 2,300 ft. Services: storage, major and minor repairs, gas: 80-91-100 oct. Manager-operator same as above. (Restricted to single engine aircraft.)

Edgartown (Martha's Vineyard) Katama Air Park 2 mi. WSW. Elev. 20 ft. Four runways, the longest 5,000 ft., sod surface. Boundary lights (arranged by 'phone in advance) Unicom (daylight hours). Services: storage, minor repairs. Gas: 87 oct. Courtesy car, taxi, restaurant. Steve Gentle, Mgr. Phone: Edgartown 2.

Falmouth Coonamessett Airport. Elev. 100 ft. 7.6 mi. N. Two runways, sod surface, the longest 4,800 ft. Strip lighting (NE/SW only). Services: 80 oct. gas, taxi, car rental, restaurant. Note: Under IFR all flights under control of Otis AFB. Call Otis RAPCON on 126.18 or 122.5 mgs; receive on 126.18 mgs. Coonamessett traffic pattern 600 ft. and all patterns lie away from Otis. Mgr. George Pinto. Tel. Locust 3-3100.

Falmouth Airport 4.5 miles NE. Elev. 40 ft. NS/SW runway, turf, 1,650 ft. No service or navigation facilities or gas. Taxi. Operator: Wm. F. Gallager. Tel. Ki 8-2982.

Hyannis Barnstable Airport. Elevation 56 ft. 1.0 mi. N. Three runways, the longest 5,000 ft. paved. Rotating beacon, runway lights. Unicom (0800-sunset). Services: major and minor repairs, gas: 80-91-100 oct. Taxi, car rental, restaurant. Airline NEA. Mgr. Earle D. Fox. Tel. Spring 5-3312.

Marston Mills (Barnstable; W. Barnstable.) Elev. 100 ft. 7 mi. WNW Hyannis. Three sod runways, the longest 2,050 ft. Gas: 80-87 oct. Storage, minor repairs. No lights, communication or navigational aids. Opr. Marston Mills Flying Service. Tel. GA 8-2392.

Martha's Vineyard (Municipal) Elev. 68 ft. S. 4 mi. of Vineyard Haven. Three paved runways, the longest 5,000 ft. Beacon and runway lights (circle field June-September. Other times arrange in advance by 'phone.) Unicom 8:00 a.m. to 6:00 p.m. Major repairs, teletype. Gas: 80-100 oct. Taxi, car rental. Airline: NEA. Mgr. T. A. Place, Tel. Vineyard Haven 550.

Nantucket (Memorial Airport) Elev. 48 ft. 2.6 mi. SE. Two paved runways, the longest 5,000 ft. Rwy. and approach lighting. Rotating beacon dusk to dawn (call Nantucket radio). Omni. Communications station, teletype, weather. Major and minor repairs; Gas: 80-100 oct. Taxi, bus, car rental, snack bar, lounge. Airline NEA. Mgr., Thomas Gibson, Tel. Nan. 1255 or 941 W.

(Continued on page 90)

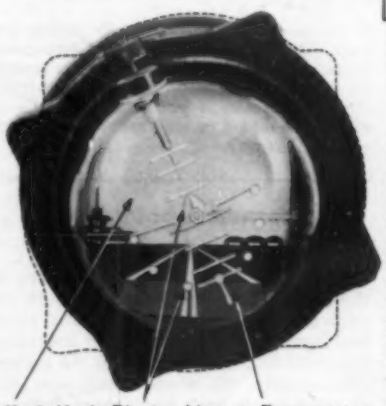
The Artificial Horizon isn't "Artificial" Anymore!

Now you can see yourself fly...with the

COFFING

3-D HORIZON

- Offers the best possible help for pilot's loss of his most critical aid—visual contact with the ground.
- Inhibits tendency of all pilots toward dangerous vertigo—even under extreme stress conditions.
- Gives instantaneous, precise 3-dimensional attitude readings, making it easier and more relaxing to fly, even in rough air.
- Eliminates "gauge chasing" when immediate reading of the plane's attitude is essential.



Vertical back face of the instrument gives full panoramic skyline.

Direct and instant pitch and roll readings given from miniature airplane and pointer from terrain platform.

Representative terrain platform remains parallel to ground at all times.

By a simple, yet unique improvement upon the basic features of the latest attitude indicator Coffing gives you

The ultimate in a functional flight instrument,

a *perfect*, *instantaneous* and *sensitive* portrayal of the attitude of your aircraft!

Fly your plane safely . . . by merely flying the little aircraft in the New 3-Dimensional Horizon.

The 3-D Horizon allows you to make 180° and all other turns with confidence and ease . . . helps cut instrument training time considerably—because it helps to remove the feeling of disorientation and the accompanying fear. *It instills confidence.*

To see for yourself the outstanding features of this instrument, contact your local operator or write direct to arrange a free demonstration ride.

Guaranteed against defective parts and workmanship, for six months. Regardless of the time on the instrument, it is priced at only $375.00.

COFFING INDUSTRIES, INC.

AIRCRAFT INSTRUMENTS AND SYSTEMS DIVISION

402 LIBERTY ST. • COVINGTON, INDIANA • Tel. 835

AIRCRAFT "DERMATITIS?"

SKYCRAFT DESIGN

"NOTHING THE MATTER WITH THE BONES — BUT, OH MY, THE SKIN"

"Doctor" Al Snyder is the man to see if your Stinson, Ercoupe, Cessna or Pacer aircraft has skin trouble. He'll convert your tired fabric wings to metal-covered in less than a week at the same cost as a fabric-recovering job . . . but good for life!

Call, write or wire for reservations. Saturday and Sunday service available.

SKYCRAFT DESIGN, Dept. FD-8, Old Star Airport, Langhorne, Penna.

BUILD AND FLY
Your Own High Performance
SPORT PLANE!

BEAT THE HIGH COST OF FLYING. JOIN THE HUNDREDS OF OTHER "HOMEBUILDERS." Simplified detailed construction prints now available. FOUR proven, economical designs. (1) Single place Playboy, low wing rugged and fast, designed for aerobatics. (2) Two place Playboy, side-by-side, low wing, comfortable, cross country and aerobatics. (3) Two place Flut-R-Bug, tandem, mid-wing, trigear. Very short take off and landing, high altitude fields. Wings easily removed for towing. (4) Two place Sky-Coupe, side-by-side, high wing, cabin, tri-gear. All purpose general utility and personal airplane. For complete details with descriptive brochures, photographs. 3-views and C.A.A. regulations on homebuilt airplanes, mail $1.00 (packaging and postal charges) to

STITS AIRCRAFT
P.O. Box 3084F, Riverside, Calif.

The World-Wide Growth of
AVIATION Offers YOU
Career Opportunities in Technology

ACADEMY of AERONAUTICS

- ★ DESIGN TOMORROW'S JET & ATOMIC AIRCRAFT
- ★ DEVELOP ELECTRONIC SYSTEMS FOR SPACE TRAVEL
- ★ DIRECT AIRLINE MAINTENANCE OPERATIONS
- ★ PLAN & SUPERVISE PRODUCTION TECHNIQUES

Classes start March and September
Write Now for Bulletin 70 for Details

LA GUARDIA AIRPORT
FLUSHING 71, NEW YORK

FLY to VERMONT

MODERN AIRPORTS

EASY ACCESS TO

RESORT HOTELS
LAKE AND BROOK FISHING
GOLF COURSES • SCENIC TOURS
FARM VACATIONS

write for FREE directory

Vermont Aeronautics Commission
State House, Montpelier, Vt.
Please send airport directory and air tourist information:

Name

Street

City State

(Continued from page 89)

Oak Bluffs (Martha's Vineyard) 0.8 mi. S. Elev. 40 ft. Two runways, sod, the longest 2,200 ft. No lights, navigational aids or communications. Taxi. Opr., Trade Wind Flying Service. Tel. Vineyard Haven 1021. Mgr., Carolyn Cullen.

Orleans Sky Meadow Airport. Elev. 400 ft. 1.1 mi. W. Runway 6-25, sand surface, 1,700 ft. Minor repairs. Gas: 81 oct. Unicom. Taxi. Mgr., W. E. Ketchen. Tel. Orleans 988.

Plymouth Municipal. Elev. 149 ft. 4.5 mi. SW. Runway 5-23, hard surface, 3,000 ft. Services: storage, minor repairs. Gas: 80-87 oct. Unicom (daylight hours). Mgr., E. W. Barufaldi. Tel. Plymouth 1407. Taxi, car rentals.

Provincetown Municipal. Elev. 12 ft. 2.4 mi. NE. Runway 7-25 paved, 3,500 ft. Runway lighting (arrange by phone in advance). Unicom, daylight hours. Gas: 80-87 oct. Taxi. Car rentals, summer season. Opr. Provincetown-Boston Airline. Tel. Pr. 240. Mgr., John C. Van Arsdale.

• *An item worth mentioning. By calling any State Police Barracks or the State Aeronautics Commission one may secure information regarding the operational status of any airport in the state. This service is particularly valuable in winter with regard to snow removal or airports open for skis only.*

I Learned About Flying

(Continued from page 56)

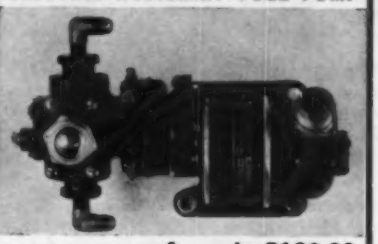
neglecting to keep full back pressure on the stick. The plane was heading off the runway toward a low wall of dirt which had been thrown up beside an irrigation. To avoid hitting it, I stood on the brakes. Immediately, the plane nosed over and skidded on its back for a short distance. Hanging upside down from the safety belt, I turned off all the electrical switches and taking a firm grip on the brace near the windshield undid the belt and crawled out unhurt. Luckily the plane did not catch fire.

Dejectedly I trudged off toward the CAA radio station to close my flight plan. There they told me that Thermal Radio heard me loud and clear. As nothing more remained to do, I put in a phone call to the Long Beach school. Two hours later they flew down and picked me up.

As I see it in retrospect, I made the following mistakes:

- Starting out on a cross-country with insufficient sleep.
- Assuming that my transmitter was out because the receiver did not work. I could at least have had help nearby; as it was, no one knew of the crash until I walked in and told them.
- Changing the landing procedure that thousands of pilot hours had endorsed, without positive knowledge that the change would be for the better.
- Letting preoccupation with a new problem make me neglect safe flying procedures. Keeping the stick back and steering with the rudder bars was more important than keeping the wings perfectly level. END

BONANZA OWNERS
at last—A CAA APPROVED
ELECTRIC AUXILIARY FUEL PUMP



for only $160.00

Now you can enjoy the tremendous safety of **DUAL FUEL PUMPS**, plus the wonderful convenience of fully automatic starting; hand-pumping to get fuel pressure for starting is now a thing of the past!

The purchase price includes complete installation kit and 6 month guarantee.

GLUCKMANN AVIATION COMPANY
61 Lick Place, San Francisco 4, Calif.
Phone Yukon 6-5351

WANTED!

Used Airplanes, equipment or accessories! The 222,000 purchasers of FLYING are always in the market for a good used plane or equipment buy. So, if you have something to sell, let FLYING's readers know about it in our classified columns. It costs very little: just 50¢ a word, including name and address. Minimum message: 10 words. For further information, write: **Martin Lincoln, FLYING, One Park Avenue, New York 16, N. Y.**

NEW
SUPER WIDGEON AMPHIBIANS

Immediate Delivery
300 H.P. LYCOMINGS

LEE MANSDORF & CO.
10635 Wixom Sun Valley, Calif.

SUNGLASSES, U.S.A.F. Type MIL-G-6250B

Cuts Haze
No Glare
Dusty Rose
Steel Frame
Guaranteed

$3.95
Postpaid
Attractive case with belt slots.

Dealer's discounts—3 or more pair
WESTAIR Box 23F Hawthorne, N. Y.

runway, then stood it up on its wing and made a spectacular turn onto final, losing so much altitude he had to use power to reach the strip. Still, I didn't have enough warning. I sat there, fat and happy, while he broke his glide just at the right time and held it off for a good three-point landing. Then, at the instant it let go, he kicked the nose over to the right to make the picture from the pilot's seat look the way it did in his side-by-side plane. We hit in a crabbing position and started into an immediate ground loop. I came to life and jumped onto full opposite control in time to recover after turning 45 degrees and almost digging the left wing tip into the pavement. Fortunately, the field was clear and we were able to roll to a stop on our new heading without hitting anything.

A few weeks later, I purchased a used Cessna 140 and took a check ride with its former owner at the Santa Monica airport. I made three landings, one with flaps, one without, and one on the wheels. All of them were good. Then my check pilot climbed out and I took off solo. I shot a touch-and-go on the mile-long, paved runway at Lomita and another on the 2,000-foot dirt strip at Gardena, then headed back to Santa Monica.

I made my approach, broke my glide, held it, then just as it paid off, I kicked the nose to the left to put it in front of me as in the L-16. The plane suddenly turned 60 degrees to the left, the tires screeched, the right hand door flew open and slammed shut, and there was a sound like a sack full of tin cans going through a counter rotating prop. One hundred feet ahead of me was an embankment which dropped off 30 feet to a taxi strip, but I had very little chance of reaching it for dead ahead and half as far away was a metal cone four feet high with a runway light at its top. I was moving too fast to stop or turn. I slapped the throttle against the stop and horsed back on the elevator.

The Good Lord reached down, picked up the Cessna and lifted it over the cone, one wheel on each side and the propeller missing the light by a fraction of an inch. I pushed the controls forward, bounced once, then went over the embankment, stalled but in the air. The plane mushed down toward some parked aircraft and a hangar, then staggered over as I picked up a little flying speed and managed a shallow turn to miss the building. The flaps were full down and air-speed was hard to gain.

Finally I was in the clear, though dangerously low and slow. I dusted roof tops at full throttle for another half-mile before I won enough altitude to raise the flaps. It took another hour of flying before I could stop shaking enough to make a landing.

With over 1,000 logged hours, a commercial ticket and an instrument rating in my pocket, I learned what I already knew when I was a student pilot.

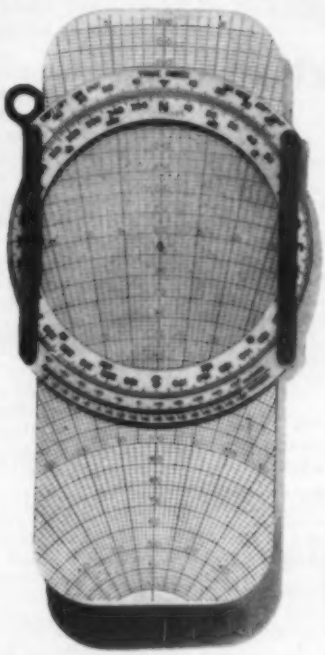
EUGENE R. WILLIAMS

Malibu, Calif.

WEEMS
AIR NAVIGATION AIDS AND INSTRUMENTS
"Around the World for 30 Years"

Now, for you who prefer it . . .

THE ORIGINAL DALTON E-6B COMPUTER . . . in Aluminum !



This new **aluminum** Dalton E-6B Computer is identical in design and operation with the world-famous **plastic** Dalton E-6B Computer. Aluminum or popular plastic . . . you can be sure that you're getting the same computer which for years has been standard with U.S. and foreign air forces and commercial airlines.

Plastic	Aluminum
$10.00	$12.50

For high speed and overseas flight, specify another **original** . . . the Dalton E-10 Computer (U.S.A.F. MB-4).

Plastic	Aluminum
$12.50	$15.00

. . . and for plotting, make sure you choose from these **original** Weems Plotters. Mark 11–$2.00 Mark 11-N–$2.50–and a new plotter for JN (Jet) charts–the PLU-1–$2.50

Available from our authorized distributors and their Airport dealers. Write for free catalogue describing our complete line and home study courses. Weems System of Navigation, Inc., Dept. 3, Annapolis, Maryland, U. S. A.

WEEMS
The trusted name in air navigation . . . . . SINCE 1928

AIRCRAFT INSURANCE
"Merit-Rated" with Aero Agency's
★ 5 POINTS OF SERVICE ★

1. Exceptionally low cost insurance. You can now obtain needed protection on an economical, practicable basis.
2. Finance your aircraft hull and liability premium if it totals over $100. An advance payment of 40% of the total is required. The balance to be paid in 3 months.
3. You receive individual service from aviation insurance specialists. The cost of your aviation insurance is "merit-rated," and claim payments for losses and loss investigations are facilitated by the Aero Agency "go-between" client and company policy.
4. Unusually broad coverage while paying less. On hull insurance, there is no charge for depreciation nor is there any deductible on a total loss. After payment of a partial loss, coverage is automatically reinstated without additional premium.
5. Your protection is underwritten by American Stock Insurance companies with the highest financial ratings for your complete protection.

AERO INSURANCE AGENCY
317 Tower Building, Washington 5, D. C.
Please send application form for quotation on hull and liability insurance for my plane.

Name .....
Address .....
City ..... Zone ..... State .....

IN NEW YORK

TOUCH DOWN at

ZAHNS AIRPORT

AMITYVILLE, LONG ISLAND
Serving Greater New York

Hard surfaced runways 4200 • Unicom • Teletype • Direct line to ATC—ATCS—IDL • ADF Instrument approach • Runway lighted all night • Rotating beacon • Motel

AIR TAXI • PIPER SALES
HERTZ RENTAL CARS

Gov't approved
Airplane and Helicopter Flying School
SALES • SERVICE • STORAGE
Tel.: Amityville 4-4200

$ CASH $ FOR AIRPLANES

Immediate Service
No Delay!

Call or Write:

VEST-MATTOON ILL. CO.
Coles County Airport
Mattoon, Illinois
Phone: Adams 5-1511

SAY YOU SAW IT IN
FLYING

FINANCING and LEASING
Lowest rates and longest terms financing plan available anywhere.
GRAUBART AVIATION INC. MOhawk 4-6260

Have You Read?

(Continued from page 14)

the X-15, designed for Mach 8 and minimum orbit altitude, is the vehicle of Project X-F18. It embodies the ultimate in refined scientific knowledge and engineering craftsmanship, and is Norco Aircraft Company's bid for an Air Force contract.

When Mitch Westerly, company test pilot assigned to the project, pushes the ship to Mach 7 and 150 miles altitude during Flight 12, he encounters, for the first time, a potentially dangerous yaw at the "controllability barrier" zone. There is no plausible scientific explanation for this phenomenon as the Big "X" is flawlessly engineered.

With only one test left before contract acceptance deadline, a flight to Mach 8 and 200 miles, pressure mounts. Westerly must decide either to make a normal "safe up and down" pattern, or conduct a "control surface" test at the "zone of danger." The former would mean a fat Air Force contract, the latter a possible historic breakthrough and a discovery that might save the life of the Air Force pilot who takes over for the orbital flight as well as open new horizons for manned space operations.

In a suspense filled climax, Searl's hero meets violent death in solving what scientific theory could not foresee nor resolve.

This is a well-written novel that captures the deep feeling of flight, probes the inner tensions, pressures and professional jealousies within the executive and management levels of a highly competitive industry. It portrays in bold realism the emotions, thoughts, fears of the men who challenge the immutable laws of nature and of their women who stand a lonely vigil awaiting their return.

SOVIET SPACE SCIENCE, by Ahri J. Shternfeld (Basic Books, $6)

First published in Moscow in 1958 and translated by the Air Force Technical Documents Liaison Office at Wright-Patterson AFB, this interesting volume gives us one of the few authentic and detailed studies of Soviet research, development and accomplishment in the fields of artificial satellites, and space flight.

Soviet author-scientist writes in semi-popular vein, covering every aspect of satellite science. Twelve major sections range from "Laws of Motion of Artificial Satellites" to "Launching," "Construction," and even "Man in Cosmic Space." Each section is divided into chapters covering sub-topics presenting an unusually frank and non-partisan picture of the Russian state of the art. Willy Ley forewords the American edition, and discusses Sputnik III and Mechta—projects which took place after publication of the book.

AIRCRAFT ELECTRICITY FOR THE MECHANIC, by Charles Edward Chapel (Aero Publisher, $5).

A practical course of home study in the fundamental principles of operation, maintenance and inspection of aircraft electri-

EXECUTIVE-PRIVATE PILOTS plan your next stop to SHANNON AIRPORT

Fredericksburg, Virginia
Midway between Washington, D. C. and Richmond, Virginia

check these facilities
- HARD SURFACED RUNWAY
- UNICOM
- ROTATING BEACON
- RUNWAY LIGHTS ON REQUEST
- 80-91-100 OCTANE
- HERTZ RENT-A-CAR
- SNACK BAR
- FLIGHT SERVICE AND MAINTENANCE

SHANNON SCHOOL OF AERONAUTICS, INC.
P. O. Box 354 Fredericksburg, Virginia
TEL. ESsex 3-4431

TOWER TALK

Here at last is the easiest and most satisfactory method of learning the procedure of landing at radio controlled airports. Practice talking to the tower in the privacy of your own home. Be sure of your ability before you land at a controlled airport. Our Phonograph record will teach you the proper radio Phraseology, as it is a facsimile of actual tower conversations. Use this record to develop your technique to a professional level. NOW TAKING ORDERS.

PRICE - $5.00.

JORDAN & LAMBERT
210 Tenth St., Aspinwall, Pittsburgh 15, Pa.

SAVE YOUR LIFE!

New sensational PILOT-SAVER IFR Hood combined with unique polarizing shield above panel prevents peeking, yet allows co-pilot complete visibility. A TIME SAVER. Only 30 seconds to simulate IFR. FOR ONLY $13.95 complete.

AERO DEVELOPMENTS
Box 165, Quincy, Ill.

MOVING? Be sure **FLYING** follows you. Please send your change of address to **FLYING.**

CIRCULATION DEPARTMENT
434 SO. WABASH AVE.
CHICAGO 5, ILL.

ENGINEERING DEGREE IN 27 MONTHS

B.S. degree (27 mo.): Aero., Chem., Civil, Elec., Mech. & Electronics. B.E. (36 mo.): Aero., Chem., Civil, Elec., Mech., Metal. B.S. (36 mo.): Math., Chem., Physics. Prep courses. Demand for grads. Campus. 20 bldgs.; dorms, gym. Low rate. Earn board. G.I. appr. Enter Sept., Dec., March, June. Catalog. 1269 E. Washington Blvd., Fort Wayne 2, Ind.

Keeping pace with progress

INDIANA TECHNICAL COLLEGE

Would You Like to Make **$1,000 A MONTH?**

That's what Stanley Hyman made selling the amazing new Presto Fire Extinguisher! Many others "cleaning up"—so can you! Amazing tiny new extinguisher ends fires fast as 2 seconds. Guaranteed for 20 years! Sells for only $4.95! Write for Free sales kit. No obligation. Merlite Industries, Dept. P-8G, Presto Div., 114 East 32nd Street, New York 16, N. Y.

cal components. Written in clear concise language and profusely illustrated with charts, diagrams and drawings.

GREAT AIRMEN, by Norman Macmillan (St. Martin's Press, $2.95).

Collection of stories dealing with famous airmen of history from the Wrights to rocket plane pilots.

FLYING JET WINDS, by C. L. Chandler (published by the author, $1.50).

A small, thorough booklet in simple phrases and drawings that explains the structure and pattern of jet streams and how to fly them.

AIRCRAFT COMMUNICATIONS SYSTEM, by J. H. M. Grover (Philosophical Library, $6).

Technical discussion of all types of air-ground radio communications equipment, its design, construction and operation.

RESCUE!, by Elliott Arnold (Bantam, 35¢)—dramatic account of USAF Air Rescue Service operations, worldwide.

KAMIKAZE, by Jasau Kuwahara and Gordon T. Allred (Ballantine, 35¢)—the personal story of a Japanese suicide pilot.

MAYBE I'M DEAD, by Joe Klass (Dell, 50¢)—novel about an AF POW death march in WWII.

BOMBER CREW, by Joseph Landon (Avon, 35¢)—novel of air combat over the Ploesti oil fields, WWII.

SATELLITE, by Erik Bergaust and William Beller (Bantam, 35¢)—story of our first step into outer space.

AIRCRAFT CARRIER, by Joe Bryan (Ballantine, 35¢)—tale of combat aboard Navy's Yorktown in Pacific waters, WWII.

SERENADE TO THE BIG BIRD, by Bert Stiles (Ballantine, 35¢)—diary of a 35 mission WWII airman that has become a literary air classic.

LOOK OF THE EAGLE, by Robert L. Scott Jr. (Ace, 35¢)--novel about an AF jet pilot and his adventures in the Far East.

THE PRISONER OF COMBINE D, by Len Giovannitti (Bantam, 50¢)—fiction-based-on-fact about an AF POW camp in Germany, WWII.

THE FASTEST MAN ALIVE, by Lt. Col. Frank K. Everest, USAF as told to John Guenther (Pyramid, 35¢)—the biography of the USAF's top rocket plane test pilot and story of the X-1 and X-2 programs.

700,000 to 1, by Quentin Reynolds (Pyramid, 35¢)—an airman, shot down on a Pacific island in WWII, is pursued by Japanese troops.

CAA EXAM AIDS

LATEST QUESTIONS & ANSWERS HELP YOU PASS NEW CAA EXAMS

GUARANTEE REFUND

EXAMS

Latest question & answer aids for passing new CAA exams quickly and easily. Includes written money back guarantee, revisions, charts, etc. Save time, money & effort. Try them at our risk. Mail the coupon today.

ANSWER EXPLANATIONS

This book clearly explains each answer found in the exam book. With both books, you have a complete ground school course. Results will be quick, easy and you will not need a ground instructor, or other books.

CAA CHECK FLIGHTS

This book clearly explains in detail how to pass the new CAA check flight. It describes new maneuvers, new requirements, oral questions and data not found elsewhere. Save time, money. Mail the coupon today.

HOME STUDY NAVIGATION

This book clearly explains how to work all basic type navigation problems in the CAA exams. Explanations of the computer, OMNI, ADF, ILS, etc. are simple, step by step, and easy to understand. Order this book today.

A & E PRACTICAL

This book clearly explains how to pass both CAA mechanic practical tests. It has a money back written guarantee, oral, demonstration jobs, welding, weight & balance, etc. Try this book at our risk. Mail the coupon today.

( ) Private Pilot Exams
( ) Private Answers Explanations
( ) Private Check Flight
( ) Commercial Pilot Exams
( ) Commercial Answers Explanations
( ) Commercial Check Flight
( ) Home Study Navigation
( ) Instrument Pilot Exams
( ) Instrument Answers Explanations
( ) Instrument Check Flight
( ) Powerplant Mechanic Exams
( ) Airframe Mechanic Exams
( ) A & E Mechanic Practical Tests
( ) Flight Engineer Exams
( ) Instrument Instructor Exams
( ) Flight Instructor Exams
( ) Flight Instructor Check Flight
( ) Helicopter Instructor Exams
( ) A.T.R. Pilot Exams
( ) A.T.R. Check Flight
( ) Tower Operator Exams
( ) Dispatcher Exams
( ) Gnd. Instr. Fundamentals Exams
( ) Navigation Instructor Exams
( ) Radio Nav. Instructor Exams
( ) Meteorology Instructor Exams
( ) C.A.R. Instructor Exams
( ) Engine Instructor Exams
( ) Aircraft Instructor Exams
( ) Link Instructor Exams

ANY 4 $10.00 ANY 2 $8.00
ANY 3 9.00 ANY 1 5.00

ACME SCHOOL OF AERONAUTICS

TERMINAL BUILDING
MEACHEM AIRPORT Phone
FORT WORTH, TEXAS MA 6-2444

☐ Payment enclosed ☐ Send COD
Please mail the items I checked above.

Name_____

Address_____

City, State_____

Pressurized and Refrigerated

MARTIN 404 FOR EXECUTIVE CONVERSION

Airplane stressed for turbo prop's. "0" time 2800-CB-16/17 engines. Airplane "0" time since base overhaul. Ground and flight refrigeration. Short field T.O. and ldg. capabilities. Quietest twin-engine aflight. Boost controls. Complete airline radio. Integral loading ramp. Dual windows. Total gas load: 1370 gals. Gross Wt.: #44,900; empty, #27,790. Trades accepted.

CALIFORNIA AIRMOTIVE SALES CORP. Dept. F

7139 Vineland Ave., North Hollywood, Calif., U. S. A.
Phones: POplar 5-6202 TRiangle 7-3361 Cable: CALMOTI

PUT YOUR PLANE IN THIS PICTURE!

* 35,000 sq. ft. of service area in huge new hangar
* All licensed A & E Mechanics for all types light single & twin-engine aircraft
* Complete Service Letters, Bulletins for all light aircraft
* Flat Rate Cost System * No Extras
* 24-hr. Security & Fire Protection
* Factory-trained CESSNA Specialists

DU PONT AIRCRAFT SERVICE, INC.

International Airport
P. O. Box 48-1367

Miami 48, Florida
TUxedo 5-2723

LATEST OFFICIAL AIRCRAFT PHOTOS

Rockets, Jets, Historical planes.
All makes, hundreds from which to choose.
SPECIAL INTRODUCTORY OFFER
with your name and address. Send only 50c
. . . select one packet.

1. 4 3½x5 photos, world's fastest Jets.
2. 4 3½x5 World War II planes.
3. 4 3½x5 of Rockets, Missiles.
4. 1 8x10 photo Boeing B-52 Jet Bomber.
5. 1 8x10 photo Lockheed F-104A Starfighter.

} All five packets for $1.00

$2.50 VALUE FOR $1
Large illustrated catalog free with each order
MAIL YOUR ORDER NOW . . . TODAY
AVIATION PHOTO EXCHANGE
Dept. F, Box 75084, Los Angeles 5, California

STITS PROPELLER SPINNER

C.A.A. APPROVED

For Installation on all Aircraft Using Fixed Pitch Props on Horiz. Opposed Engines thru 170 HP Aeronca, Bellanca, Cessna, Champion, Commonwealth, Culver, Ercoupe, Funk, Swift, Interstate, Luscombe, Mooney, Piper, Porterfield, Stinson, Taylorcraft, Trojan, etc. etc. Aerodynamic Contour Increases Prop Hub Efficiency. Proven in Thousands of Hours Service to Decrease Oil & Cyl. Head Temp. Size 8" dia. x 11½" long. Installation Kit Includes all Parts & Complete Detailed, Illustrated Mounting Instructions. Each Prepaid.....$20.00

ORDER TODAY & DRESS UP YOUR AIRPLANE
Dealers Inquiries Invited
STITS AIRCRAFT, P. O. Box 3084F, Riverside, Calif.

FREE ILLUSTRATED AIRPLANE LISTS

with complete current price, condition and equipment information contained.

Mail this coupon today!

I am interested in:

☐ TRADING—a description of my plane is attached
☐ BUYING—Please forward your list
☐ SELLING—a description of my plane is attached

Low rate financing available on all planes—delivery anywhere.

NAME_____
ADDRESS_____ PHONE_____
CITY_____ ZONE____ STATE_____

PHONE: DUdley 8-2475
24 HOURS A DAY

COMBS AIRCRAFT

HANGAR 7, STAPLETON AIRFIELD, DENVER 7, COLORADO

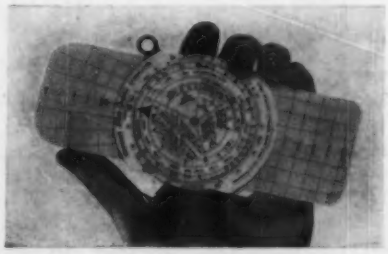
Briefings . . .

(Continued from page 10)

duced last year at Martha's Vineyard Air Service, Inc., Edgartown, Mass. (Katama Airpark) six other locations have since been approved: Prescott Air Service, Prescott, Ariz.; Red Aircraft Services, Inc., Ft. Lauderdale, Fla.; Jamestown Aviation Co., Jamestown, N. Y.; Western Hills Lodge, Wagoner, Okla.; Tuft-Edgcumbe, Inc., Boulder Junction, Wis.; and Jackson Hole Scenic Flights, Jackson, Wyo. At any facility approved by Piper, a family group can combine accelerated flight training for the adult members with carefully screened resort facilities for the rest of the family. Other approved facilities will be announced from time to time by Piper.

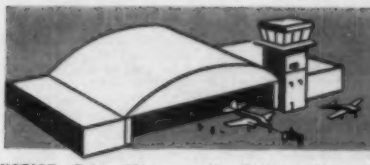
FIRST MAN to be named Army Aviator of the Year is Capt. James T. (Butch) Kerr, a 19-year career man, who received the award recently from the Army Aviation Association. Kerr, now 39, began his aviation career as a civilian aircraft mechanic's helper in Greenwood, Miss. Entered the service as a private and 11 years later (1951) was commissioned a 2nd Lieutenant. Since that time he has added an impressive string of FAA certificates and ratings. Is currently a Senior Army Aviator, a designated Army Instrument examiner with special instrument card for fixed wing aircraft and helicopters.

SLIDE-TYPE COMPUTER, OF SHIRT POCKET SIZE, which fits the palm of the hand and gives accurate results at "Cub" speeds and higher is a Jeppesen innovation. Modernized to feature latest practical improvements by the military services, it is available in white plastic or aluminum and designated "Slide Graphic" CSG-1. A one-half size larger model, the CSG-2 Navigator is also available for those who prefer a larger computer.



ALONG THE APPROACHES to two of the world's busiest air traffic hubs, New York's ARTC at Idlewild and Washington National Airport, Remington Rand's electronic computers have taken

(Continued on page 98)



AVIATION MARKET PLACE

NOTICE: Rates, 90¢ per word. Minimum 10 words. October Issue Closes August 7th. Send order and remittance to FLYING, One Park Ave., New York City 16

AIRPLANES FOR SALE

AMPHIBIANS

BRAND new Widgeons, for immediate delivery, 300 H.P. Lycomings, Six place, long range. Lee Mansdorf and Co., 10635 Wixom St., Sun Valley, Calif. Stanley 7-0214.

CESSNA

170's: 16 FROM $4450. 1955 painted 170B, #AAA/F, has 170 hours SMOH. Gyros. LF. Lear LTRA-6 VHF transceiver with omnimeter. Undamaged. Very clean. Relicensed May. $5850. Also: Like new 1952 painted 170B, #QQQQQ/F, wih only 290 hours. LF. VHF. Omnirange. ADF-12, L-2 autopilot. Hangared. Undamaged. $6900. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

180's: 10 FROM $8000. Beautifully painted 1954, #XSS/CF, has 450 hours. 60 hour factory remanufactured engine. Gyros. Rotating beacon. Dual Mark 2 omnigators with LF receivers and VHF transceivers. ADF-12. Top condition. $9575. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

180 AMPHIBIAN: Probably best available, painted, 1958, #RGSF/DF, has only 150 hours. Factory floatplane built. Dual Omnigator-Omniplexer VHF transceivers. Sunair VHF transceiver. ADF-12E. Many extras. No corrosion. Like new. Relicensed March. Cost about $33,000. Asking $25,000. Try offer $22,000. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

182's: 10 AVAILABLE. Painted, 1956, #RRTF/BF, has 415 hours. Rotating beacon. Gyros. LF. Omnirange. Clean. Only $9300. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

LATE 1957 Cessna 310A, Green and White, Black Stripe. Gold interior. Total time, engines and airframe, 814.00 Hours. Radio, ARC-15 Omni, Narco Mark II, Omnigator, LVTR-36 Transceiver, Lear ADF-12E, Flite-Tronics R-89B glide path. 3 Lite Marker Beacon. Oxygen, 2 rotating beacons, Long range Aux. Tanks, Prop Anti-ice slinger rings, taxi light, ice light, dual controls. Always Hangared, 50 and 100 Hours Inspections Performed. Professionally flown. Low, Low Price, $41,000. Call Or Write. Pacific Bridge Company, North Harbor, Alameda, California, LAkehurst 3-7426.

GRUMMAN

AMPHIBIANS; Excellent selection practically all models. McKinnon-Hickman Super Widgeon, #15/F, has 175 hour 260HP engines and full feathering metal propellers SMOH. Five place. 4 receivers. 3 VHF transmitters. ADF-12. Extras. Clean. Mechanically excellent. $45,000. Make offer. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

HELICOPTERS

DUCTED fan design. Used in V.T.O.L. aircraft and flying platforms. Specifications and five pages of drawings. $2.00 Tyna-Turbine Engines, Box 11253, Phoenix, Arizona.

MCCULLOCH Drone engines & parts, New & used. Write for your needs. D. F. DeLong, 619 E-8th Ave., Eugene, Oregon.

HELIO

COURIERS; 4 available. 1955, #FXST/BF, has 350 total hours. Gyros. LF. Lear LTRA-6 VHF, omnirange. Extras. Hangared. Undamaged. All bulletins. Clean. $16,500. Also; 1958 model with wheels and floats $28,750. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

CORPORATION-owned Helio Courier, May 1957, five-place, real creampuff, always hangared, never damaged, good engine plus spare factory-new engine with installation prepaid. Omnigator Mark II, Simplexer, Omniplexer, ADF 12 E, landing lights, Goodyear crosswind gear, all bulletins up, full panel, flown actual instrument, safest plane made, $21,000. Reply to P. O. Box 71, Franklin, Penna.

NAVIONS

1948, PAINTED, #FRGF/KF, has 95 hours SMOH. Metal propeller. Auxiliary tank. Gyros. LF. Lear omnirange. ADF-12. Extras. Clean. $6750. Also: 260 HP, #RXRP/KF, with 92 hours SMOH. Gyros. LF. Omnirange. ADF. Relicensed March. Only $7750. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

PIPER

COMANCHES; 7 available. 1958 #RSFQ/PF, has 397 hours. Gyros. LF. Mark 2 Omnigator. ADF-12E. Undamaged. Hangared. Beautiful. $13,900. Powers & George, 475 Fifth Avenue, New York 17, N. Y. "Exporting."

'59 COMMANCHE "250" To Sell, Trade or Finance. Curtis Sky Ranch, Bryan, Texas.

AIRPLANES MISCELLANEOUS

$2.00 CAN Save you hundreds. It's New! Now you can receive information each month on hundreds of aircraft for sale throughout the United States. At a glance you will know what is available, hours, date licensed, price, etc., of practically every type of airplane manufactured. We tell you who owns the aircraft and you deal direct, saving time, eliminating hours of travel, and by knowing the market you get the best deal possible. You can receive your first copy listing aircraft for sale immediately. Don't wait! Send $2.00 Today for a full year's subscription. Flyers' Market, published by Aircraft Listing Bureau, 5305 Congress Street, Chicago 16, Ill.

POWERS & George, 475 Fifth Avenue, New York 17, N. Y., America's First Aircraft Brokers since 1947, have hundreds of airplanes for sale from $3500. Request listings, furnishing specifications and price range. Hundreds of satisfied buyers. "Exporting."

AIRPLANES WANTED

SINCE 1947, Powers & George, Aircraft Brokers, 475 Fifth Avenue, New York 17, N. Y., have sold hundreds of aircraft from $3500 for owners. List yours free, non-exclusively. "Exporting."

TRADE United States Patent 2747876 Covering Laminated Glass Archery Arrow For Licensed Champ T-Craft Or Cub On Floats 400,000 Archers In Country. Patent Worth Thousand To Individual For Own Business. Rocky Teller, Duluth, Minnesota.

HELICOPTERS

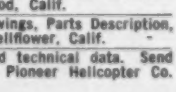
HELICOPTER business, training and employment opportunities. Details free. Aviation Service, Holtsville 13, N. Y.

ONE-MAN Helicopter, Kits, Plans. Free Brochure. Adams, Box 6042-Y, Lakewood, Calif.

FLYING Platform. Three Drawings, Parts Description, $2.00. Rotron, Box 573-Y, Bellflower, Calif.

HELICOPTER, Blue prints and technical data. Send $2.00 for 3 view drawing. Pioneer Helicopter Co. C Box 357 Hallandale, Fla.

EQUIPMENT, PARTS AND ACCESSORIES



PAY 1¢ on the dollar or less on Government Surplus Jeeps, airplanes, boats, thousands of useful items. Buy direct from U. S. Government. Anyone can! Mail $1.00 for 1959 directory of depots and how to buy. Western Metal, Dept. 108, Box 954, Dallas 21, Texas.

BUY surplus aircraft, fuselages, engines, instruments, accessories, electronics, radio-phones, helicopters, etc. direct from government. List, procedure $1.00. Included Free: "Non-government surplus." "Second-hand bargain" reports. Christopher Publications, Holtsville 25, N. Y.

LARGEST stock in the U. S., of New, Used, and Overhauled engines, propellers, accessories and airframe parts. Free lists by makes. Univair, Dept. D, Box 5306, Denver, Colo.

NEW "Mark V111-C improved Dead Reckoning Computer with instructions, pocket size $2.50"; New E-11 pocket size high speed, high Altitude Computer $5.00; New "Airlines Computer," $9.00; "Batori Pilot's all metal Computer," $15.00; Pressure Pattern Drift, $2.50; Pressure Pattern Plotter, $3.00; New E-6B, $10.00; Air Force Jet Pocket Computer, $7.50; Free Catalogue. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, California.

AVIGATION Proximiter—Most practical, simple to operate plotter/computer ever designed for VFR pilots —only $2.50. XC Flight Record Book—Plans your flight for safety and convenience—only $1.50. Jo-Co Industries—Box 113—Torrance, Calif.

CHARTS and MAPS

WORLD coverage of all current aeronautical maps and charts. Agents for Coast & Geodetic Survey, Hydrographic Office, Air Force. Free catalogue available. Pan American Navigation Service, 12021-8 Ventura Blvd., N. Hollywood, Calif.

LOG BOOKS

STEELE'S Pilot Log $1.50; Pilot Flight Record Log $1.00; Senior Pilot Log $5.70; Flight Navigation Record (Deluxe) $5.70; Air Stewardess Log $2.00; Deluxe Navigator Log $5.70; Flight Engineer Log (Deluxe) $5.70; Aircraft Log $1.50; Engine Log $0.70; Pilot Progress Rating Log $1.00. (Free catalog.) Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

AVIATION BOOKS

WARNING—CAA examination is being changed: It takes more than questionnaires to prepare you for the new "open-book" CAA examinations. You need the text and background material that only the authoritative up-to-date Zweng Manuals provide. Used by aviation schools throughout the world. Fully illustrated, each manual averages more than 300 pages, with latest examination, too. There's a proven Zweng Manual for each rating: "Helicopter Rating," $5.00; "Commercial & Private Pilot Ratings," both for $4.00; "Instrument Rating," $5.00; "Airline Transport Pilot," $5.50; "Flight Instructor," $5.00; "Flight Engineer," $5.00; "Aircraft Dispatcher," $5.00; "Safety After Solo," new revision, $4.75; "Parachute Technician," $3.00; "Aircraft & Engine Mechanics" (including hydraulics, weight & balance), and new "Electrical Examination," $5.00; Meteorology for Airmen with examination (Zweng), $3.00; "Manual of the E-6B Computer," $3.00; "Rules of the Air," Indexed, illustrated, $2.00; and "Ground Instructor Rating, including examination," $4.00, prepares you; "Flying the Omnirange," $4.00; "Encyclopedic Aviation Dictionary," $6.00; "American Flight Navigator 1958 Deluxe Edition—examinations (Dohm)," $6.50; "Air Navigation," Gold Medal Edition (Weems) prepares for Navigator Rating, $6.00. We supply any book by other publishers, including: "Jet Aircraft Power Systems," $10.75; "Radio Operator's License," $6.60; Practical "Air Navigation" (Lyon), $3.00; "Stick and Rudder" (Langewiesche), $5.75; "Crop Dusting" (6 manuals), $12.50; (Free Catalog). Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

LIGHTPLANE design book, proven plans, $4.75. Brochure, dime. Wm. Fike, Box 683, Anchorage, Alaska.

USED Aviation Books. World's largest stock on both Wars, including Zeppelins, Janes, Yearbooks, etc. 60-page catalogue 25¢ coin. Stuart, Fairlight Hall, Hastings, England.

"I SAW a Flying Saucer" by A. H. Scharf. Send $1.00 to 2411 Dufferin Ave., Saskatoon, Saskatchewan, Canada. Print your name and address plainly.

AIRLINE Lore. List Free. George Janes, 2235 35th Avenue, San Francisco, California.

AVIATION books, magazines. 36 page catalog 25¢. Aviation Literature, 180 Stevenson South, Oshawa, Ont., Canada.

AN Airplane In Every Garage by Daniel Zuck, Vantage Press, New York. A new book 190 pages, 117 photographs and illustrations, filled with new ideas to make personal aviation useful family transportation. Send $3.95 to Plane-Mobile, Dept. A11, 14273 Beaver St., San Fernando, Calif. Reg. price $4.50.

FREE mail-order catalog. Aviation Books of all publishers. Aero Publishers, Inc., 2162-F8 Sunset, Los Angeles 26, California.

PARACHUTES

NEW Surplus—Sky Diving—Personal, Used $27.50 up. CAA, Guaranteed. "Export Shipments." Midwest Parachute, Novi, Michigan.

PHOTOS

AIRPLANE photographs, beautiful large 14 x 17 color reproductions. Decorate dens, etc., with war planes in action. Six assorted. Send $1.00. Jarvis, Box 126 F, Bostonia, Calif.

AVIATION Photo & Book Collectors! New lists of photos & books now available. Including Pioneer, WWI & II. Exclusive photos of Historical planes, latest Jets. Send 25¢ for sample photo & book lists. Airbooks, P. O. Box 958, New Rochelle, N. Y.

AIRCRAFT FINANCING

BUSINESS and Executive Low Cost Aircraft Financing. New Special Service covers installation of Radios—Instruments—Electronic Equipment and Major Engine overhauls. Skyways Aircredit Corp. P. O. Box 1227, Ogden, Utah. Telephone Export 3-8449.

AIRCRAFT Financed to 30 months. Rates as low as 6% insurance coverage and financing also available. Savanna Investment and Trust Co., National Bank Bldg., Savanna, Ill.

JOIN The National Aero Club. Group insurance, aircraft financing, flight planning, weather and emergency services. Dues $5.00 per year. Write NAC 2311 Shelby, Ann Arbor, Michigan.

PERSONAL Aircraft Financing, Nation Wide. Any licensed airplane, new or used, fabric or metal. Financing up to 75% for periods to 36 months. Available to dealers or individuals. Write, Wire or Call —Air-Credit Sales Co., P. O. Box 1248, Walteria Station, Torrance, California. Phone Davenport 6-8970.

INSTRUCTION

OPERATORS, Instructors, Schools: prepare your students for the top—with Zweng Manuals. Complete Texts, latest typical examinations. Free catalogue. Aeronautical and Marine discount sheet. Pan American Navigation Service, 12021-8 Ventura Blvd., North Hollywood, Calif.

PLANS — Kits — Materials — Jodel D9 & D11, Jurca Tempete, Maranda RA-14, Fauvel Sailplanes, Volswagen Conversion. Catalog—10¢. Falconar Aircraft Municipal Airport—Edmonton, Alberta.

ELECTRONICS and Aeronautical Engineering Technology. Two year courses. Bachelor of Science Degree in three years. Northrop Institute in Southern California prepares you for highly paid positions in Aviation and Electronic Industries. Employment assistance during school and after graduation. Approved for Veterans. Write for free catalog. Northrop Institute of Technology, 1183 Arbor Vitae, Inglewood 1, Calif.

LEARN Aircraft & Missile Drafting! Our Home-Study Course can prepare you for a career in Aviation. Free information. Pacific Aero Institute, Dept. F, P. O. Box 4185, Inglewood, California.

LEARN to Fly. Get paid while learning. Qualify for Flying Cadet, Officer Candidate or Specialist Training in armed forces. Prepare quickly for qualifying examinations. Air Science Self-study Preparatory Course, Complete $12.00. Individual practice tests with answers; Flight Aptitude, $3.25; Officer Candidate $5.00; College and High School Equivalence, $6.00. Prepaid. Cramwell Publishing Co., FL-7, Adams, Mass.

FLIGHT Test performance evaluation and data reduction training at home. Five lessons, $3.00 each. Aero Testing Company, 1312 Beaumont Drive, Wichita 4, Kansas.

OVERNIGHT STOPS

MAKE the most of your West Coast trip with the Vacation Air Guide. Lists 400 fields in seven states, B. C.; recreation attractions, accommodations, pilot info. $3.00 per copy. Vacation Air, 1949 East 28th, Eugene, Ore.

MONTAUK point, Long Island—Sea and Sky Portel Resort area motel, Flying Fish Restaurant Cocktail Lounge, Marina, Airport 10 H35U. Hertz. Fishing, Swimming, golf, tennis, riding. Lake Drive, Montauk, N. Y.

MOVING?

Make sure you notify our subscription department about any change of address. Be sure to include your postal zone number as well as both old and new addresses. Please allow four weeks' time for processing.

FLYING
434 South Wabash Avenue
Chicago 5, Illinois

BUSINESS OPPORTUNITIES

CAPABLE operator needed specializing in sales and flight. Shop already staffed. Completely established midwestern airport being expanded with additional individual hangars and paved runways. Two popular aircraft franchises possibly available. Will lease. Excellent profit potential. Clear Ridge Aviation, Inc., 72nd and Crown Point Ave., Omaha, Neb.

$30-$60 WEEKLY addressing Envelopes at Homes. Instructions $1 (refundable). Reiss, 210 Fifth Ave., Suite 1102-M, New York 10.

START your own aviation business with little capital. 47 opportunities. Details free. Christopher Publications, Holtsville 1, N. Y.

AVIATION Operators: Many operators are increasing their income by stocking Zweng Texts and general aviation supplies. Apply for a Dealership now. Pan American Navigation Service, 12021-8 Ventura Blvd., No. Hollywood, Calif. (Free Catalog.)

JOBS Overseas! Write Janeck Development Co., 109 Hub Station, New York 55, N. Y.

WANTED: Outdoorsman/commercial pilot. Partnership hunting, fishing lodge. North Country Lodge, Horsefly, British Columbia.

CIVIL Service Jobs—Overseas, U.S.A.—mechanical, clerical, professional. List $1.00. Civil Service Bulletin, 115 Haypath Road, Plainview 2, New York.

1400 SQ. ft. at Van Nuys, California Airport. Includes one office and shop area. Planeservice Inc., 7240 Hayvenhurst Ave., Van Nuys, Calif. State 6-1410.

HELP WANTED

AMERICAN Overseas Jobs. High Pay. Men, Women. Transportation Paid. Free information. Write: Transworld, Dept. 34, 200 West 34th St., New York 1.

JOB Seekers: Reports from U. S. Government on Federal Employment in Alaska and overseas, containing information on skills wanted, where to apply. Also over 600 names and addresses of U. S. firms operating in Spain, France, Germany, England, Japan, Australia, Turkey, Venezuela, many other countries. Also included Free specimen questions and answers from U. S. Civil Service Examinations for Typist, Stenographer, Clerk, Nurse, Postal Service, Stock, Policeman, Engineer, Wildlife, Fishery, over 80 other job titles. Only $2.00, airmail $3.00. Satisfaction guaranteed or return for your money back. Guide, Dept. 104, Box 954, Dallas 21, Texas.

AVIATION Jobs—Names and addresses of companies to contact. $1.00. Fitzgerald (Chicago Division), Dept. A-1, 815 Countryside Drive, Wheaton, Illinois.

HIGH-PAYING Jobs Now Open! We will rush latest confidential reports on best employment opportunities (foreign, domestic, skilled, unskilled). Hundreds of aviation jobs now available! Also, jobs in electronics, construction, shipping, oil, and other lines. Application forms. Free registration. One-year advisory service. All for $2.50 ($2.85 Airmail). Unconditional Money-back Guarantee. Aviation Employment Information Service, Holtsville 7, New York. Six reports included Absolutely Free: (1) Pilot's Business Flying Directory; (2) Helicopter Opportunities; (3) Government Foreign Service; (4) Directory of Companies with Foreign Branches; (5) Alaskan Opportunities; (6) Directory of Airlines and Aircraft Manufacturers.

COPYRIGHT Reports on best paying opportunities in foreign and domestic employment for skilled and unskilled. Aviation, construction, government, oil, shipping, laborers, office-work, trades, factory, supervisory, unusual jobs of many types. Special reports for pilots, engineers, mechanics, all aviation specialists with Airlines, Feederlines, Aircraft Factories. Cropdusters, Corporation Aircraft, etc. One year registration-advisory service. All for only $2.00 ($2.25 airmail). (Reports sent C.O.D. on request.) Satisfaction guaranteed or double your money back. Our 12th successful year. Act today for best paying jobs. Research Services, Suite 514 F, Meramec Building, St. Louis 5, Missouri.

PILOTS wanted to train as agricultural aerial applicators, earn big money, Free job placement service, full curriculum, flight and ground school, free literature, Agricultural Aviation Institute, Douglas-Tahoe Airport Minden, Nevada.

SITUATIONS WANTED

BUSINESS executive desires position combining flying and business; age 36, college graduate, 2600 hours Navy multi-engined aircraft, commercial and instrument rating, excellent references, now located in Mid-West. Box 169, % Flying, One Park Ave., New York 16.

MISCELLANEOUS

FLYING Bird—by Whamo Mfg. Co., $2.00 Postpaid. Carol's Toyland, 316 W. Main St., Visalia, Calif.

GOVERNMENT Sells—Surplus Aircrafts; Fuselages; Assemblies; Accessories; Engines; Instruments; Electronics; Boats; Amphibious Vehicles; Jeeps; Misc.— You buy direct now from U.S. Government Depots at fractions of Army & Navy costs—Send for bulletin "Depot List & Procedure"—$1.00. "Government Surplus Sales" Box 425-B, Nanuet, N. Y.

LETTERS, Numbers & Decals—Precut self-adhering Vinyl "Regaletters" eliminate masking and spraying. Available in 4", 12" and 20". Also American and Confederate Flags, 8" x 13½". Also General Usage Decals. Permanent colors. Meets CAA regulations. See your Distributor or: Regal Air Corp., 500 Fifth Ave., NYC.

SHOPPING GUIDE
Classified

A handy reference to products and service not necessarily for aviation, but of wide general interest.

PHOTOGRAPHY—FILM, EQUIPMENT, SERVICES

FREE! Blackhawk's big sale catalog 8mm., 16mm. movies, 2"x2" color slides. Biggest selection anywhere! Projectors, cameras, supplies—big discounts! Get free, every month, 24-page newspaper size bargain list! Blackhawk Films, Davenport 10, Iowa.

STAMPS & COINS

COIN magazine, 200 pages. Sample 40¢. Scrapbook, 7328 Milwaukee, Chicago 48.

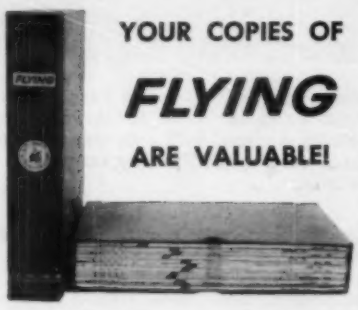
REVISED Coin Bargain Catalog, 25¢! Dollar Collections: (7 Indian Cents); (6 Liberty Nickels)—both, $1.89! "Prices Paid" listing, $1.00! Sullivan, 128-FH East Fourth, St. Paul 1, Minnesota.

MISCELLANEOUS

INVENTORS. Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 818 Victory Bldg., Washington 1, D. C.

"WINEMAKING: Beer, Ale Brewing." Illustrated. $2.00. Eaton Books, Box 1242-Y, Santa Rosa, California.

ELECTRIC Pencil: Engraves all Metals. $2.00. Beyer Mfg., 10511-ZD Springfield, Chicago 43.



YOUR COPIES OF

FLYING

ARE VALUABLE!

Keep them neat . . . clean . . . ready for instant reference!

Now you can keep a year's copies of FLYING in a rich-looking leatherette file that makes it easy to locate any issue for ready reference.

Specially designed for FLYING, this handy file—with its distinctive, washable Kivar cover and 16-carat gold leaf lettering—not only looks good but keeps every issue neat, clean and orderly.

So don't risk tearing and soiling your copies of FLYING—always a ready source of valuable information. Order several of these FLYING volume files today. They are $2.50 each, postpaid—3 for $7.00, or 6 for $13.00. Satisfaction guaranteed, or your money back.

JESSE JONES BOX CORP.,
Dept. F
BOX 5120, PHILADELPHIA 41, PA.
(Established 1843)

PICTURE CREDITS

10—WIDE WORLD
25—CHARLES F. BLAIR, JR. COLLECTION
27—CHARLES F. BLAIR JR. COLLECTION
29, 30—CHARLES F. BLAIR JR., COLLECTION
31—"JUNGLE JIM"
32, 33—DENNIS STOCK — MAGNUM PHOTOS, INC.
34—PANAM
35—OTTO BEHRENS, PANAM
36, 37—WOODROW JARVIS
39—CAL SMITH
40—MEL LAZURUS
41—CHAMPION AIRCRAFT, ED KEEHN
42—EWING GALLOWAY
43—MASSACHUSETTS AERONAUTICS COMMISSION
44, 45—AIR FORCE
46, 47—COLLECTION OF GEORGE BLAISDELL
48, 49—U. S. ARMY
50—JIM LARKIN
52—HOWARD LEVY, READING AVIATION SERVICE, INC., VERTOL AIRCRAFT CORP.
53—BEECH AIRCRAFT CORP., ADAMS-WILSON HELICOPTERS, INC., GOODYEAR AIRCRAFT CORP.
54—ACME PHOTO
60—AVIATION NEWS PICTURES
78—GEORGE PINTO
94—BELL HELICOPTER CORP.
98—MEL ADAMS & ASSOCIATES, AC SPARK PLUG, GENE VIRTS, WILLIAM W. BACON III

AUGUST 1959 FLYING ADVERTISER'S INDEX

ADVERTISER	PAGE NO.
AC Aircraft Spark Plugs	17
Academy of Aeronautics	90
Acme School of Aeronautics	93
Aero Design & Engineering Co.	7
Aero Developments	92
Aero Insurance Agency	91
Aero Products	84
Aircraft Finance, Inc.	68
Aircraft Radio Corporation	57
Airline Operations Training, Inc.	70
Airtex Products	83
Alpha Corporation	3rd Cover
American Airlines	23
American Flyers Incorporated	83
Arizona Aircraft Storage Branch	75
Aviation Photo Exchange	94
Aviation Service Corp.	80
B & H Instrument Co., Inc.	59
Basch Co., George	84
Beech Aircraft Corp.	53
Bensen Aircraft Corp.	76
California Airmotive Sales Corp.	93
Cessna Aircraft Company	15
Champion	67
Champion Spark Plug Company	12, 13
Coffing Industries, Inc.	89
Collins Radio Company	2nd Cover
Combs Aircraft	94
Daniels Aircraft, Jack	81
Dare Inc.	8
Dave's Army & Navy Store	82
Douglas	9
Downer Aircraft Industries, Inc.	73
Du Pont Aircraft Service, Inc.	94
Edo Corporation	64
Electric Auto-Lite Company, The	68
Electric Power Door Co., Inc.	68
Embry-Riddle Aeronautical Institute	74, 79
Esso Standard Oil Company	55
Florida Aircraft Radio & Marine, Inc.	62
Flying Equipment Sales Co.	80
Flying Classified	90
Flying Subscriptions	64
Flynn, Dr. John T.	76
Fruhauf Southwest Uniform Co.	66
Gabb Special Products, Inc.	72
Gem Aircraft, Inc.	85
Gluckmann Aviation Company	90
Goodyear Aviation Products	3
Graubart Aviation Inc.	62, 84, 92
Greenwich Book Publishers, Inc.	68
Gull Model Airplane Company	88
Hartzell Propeller, Inc.	80
Hi Fi Review Reprints	82
Indiana Technical College	92
Insurance Company of North America	88
Jardur Import Co.	82
Jeppesen & Company	78
Jones Box Corp., Jesse	97
Jordan & Lambert	92
Kane Aero Equip't.	66
Lear Inc., LearCal Division	18, 19
McCauley Industrial Corporation	77
Manger Hotels	76
Mansdorf & Co., Lee	90
Merlite Industries	92
Meyers Aircraft Co.	86
Mohs Seaplane Company	82
Mooney Aircraft, Inc.	21
National Aeronautical Corp.	20
Northrop Institute of Technology	16, 69, 86
Nova-Tech, Inc.	14
Pan American Navigation Service	6
Parks College	60
Piper Aircraft Corporation	5
Popular Photography Color Annual	97
Puritan Compressed Gas Corporation	81
Ross Aero Publishers	87
Ross School of Aviation	87
Sensenich Propellers	62
Shannon School of Aeronautics, Inc.	92
Shell Oil Company	4th Cover
Skycraft Design	89
Skyhopper Airplanes, Inc.	74
Socony Mobil Oil Company, Inc.	11
Southwest Airmotive Co.	85
Southwestern Industrial Electronics Company	88
Sparton School of Aeronautics	65
Standard Oil Company of California	61
Stits Aircraft	90, 94
Survival Equipment Co.	76
Teterboro School of Aeronautics	82
U. S. Air Force	71
Varsity Shop Specialties	72
Vermont Aeronautics Commission	90
Vest Aircraft Co.	64
Vest-Mattoon Ill. Co.	92
Weapons, Inc.	70
Weems System of Navigation, Inc.	91
Westair	90
Zahns Airport	92

ON SALE NOW AT NEWSSTANDS— OR ORDER BY MAIL TODAY!

POPULAR PHOTOGRAPHY'S 1959

COLOR ANNUAL

Here's the publication photographers everywhere have awaited—the 1959 COLOR ANNUAL! Compiled by the editors of POPULAR PHOTOGRAPHY, it's a handsome 172-page tour of the breath-taking world of color photography!

The 1959 COLOR ANNUAL highlights the year's finest color photography . . . features authoritative studies and a provocative symposium . . . plenty of facts and technical data. Here's just a sampling of what you'll enjoy in the 1959 edition:

- **A symposium of experts on WHAT MAKES A GOOD COLOR PICTURE?**
- **Ten-page portfolios by two masters: Emil Schulthess and Hy Peskin**
- **How a pro like Ralph Morse solves problem pictures**
- **A look at color photography by the inventors of Kodachrome**
- **A forty-page International Portfolio**
- **Technical review of the year**
- **Notes on all pictures—why they were chosen, how they were made**

The 1959 COLOR ANNUAL is on sale now at newsstands or order by mail today—using the handy coupon below.

Ziff-Davis Publishing Company
Department F89
434 South Wabash Avenue
Chicago 5, Illinois

Please send me a copy of the 1959 COLOR ANNUAL. I enclose $1.25, the cost of the ANNUAL, plus 10c to cover mailing and handling charges.

NAME .....

ADDRESS .....

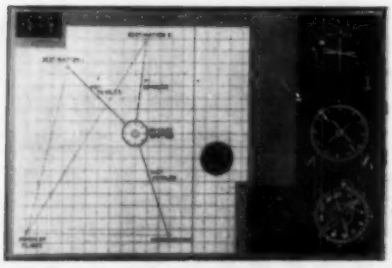
CITY.....ZONE... STATE.....

Briefings . . .

(Continued from page 94)

over major roles in air traffic control. The computers will not replace human traffic controllers, rather they will relieve them of time-consuming "bookkeeping chores." By late summer FAA will install similar systems at the Pittsburgh, Cleveland and Boston ARTC Centers.

NEW IN NAVIGATION TRAINING devices is Lockheed Aircraft Service's Model 105, a device designed to instruct flight personnel in the theory and operation of Visual Omnirange/Distance Measuring Equipment (VOR/DME). A portable unit



containing a graphic display panel, it utilizes a movable aircraft silhouette, a simulated beacon station and animated, oversize instrument and control mock-ups corresponding to actual aircraft units. Address LAS, Special Devices Div. Ontario, Calif.

A CLIP-ON SPECTACLE SHADE, adjustable to deflect sky glare, recently developed by Dr. A. Roth of New York is being distributed by Opticon, 220 W. 42nd St., New York City. Made of black, green or

red plastic, the shade is adhered to a patented bridge-conforming clamp which fits snugly onto the bridge of standard spectacle frames without coming in contact with the lenses. Clamp is in gunmetal or chrome. Price complete $1.

FLIGHT RESEARCH, INC., Richmond, Va., (P. O. Box 1-F) has available for the business aircraft market a new version of its Dynavia Autopilot Omni Coupler. Designated the ANC-3, this device combines the output of an omni receiver and the stabilized magnetic heading information from an ARC Course Director to furnish continuous control signals to the rudder and aileron axis of the Lear-2 Autopilot for automatic enroute navigation. Miniaturized, ANC-3 weighs 4 lbs. It is available for either 14 or 28 volts and basic price is $1,050 plus installation.

PRODUCTION PLANS for an executive version of the Douglas B26 are underway at L. B. Smith Aircraft, Miami, Fla. With completion scheduled for September of this year, the first production executive B-26 is progressing satisfactorily. The company will produce both the pressurized and non-pressurized versions under the trade name of Tempo at its Miami International airport facility.

NATIONWIDE DISTRIBUTION of a space age teaching aid, the Massachusetts Inst. of Technology and A.C. Spark Plug Co. developed gyroscope has been announced by A.C. Commercial sales will be handled by Central Scientific, 1700 Irving Park Rd., Chicago; military sales by AC. In

three models, deluxe, standard and single degree of freedom, the prices will range from about $161 to $254. A precision instrument, the gyroscope weight 17 lbs.; is 15 inches high, and operates on 110-115 volt alternating current.

SEA-LEVEL READING BAROMETER is a new development by the Bulova Watch Co. A direct-reading portable instrument, weighing 15 lbs., this barometer, uses the new Melchior-type aneroid capsules instead of a tube of mercury. Tape display permits easy-reading of pressure in thousandths of inches; and, adjustment device permits instrument to show sea-level reading regardless of altitude. It is designed principally for use in weather stations and airport control towers.

COMPLETE AUTHORITY over all airspace matters is as of May 15 last now vested in the FAA, eliminating the Air Coordinating Committee entirely. FAA has introduced new procedures which it believes will greatly simplify and expedite the handling of requests for allocation of navigable airspace for special uses. The new procedures do not, however, apply to matters relating to radio and TV towers. Part 409 of the Regulations give procedures to follow in requesting use of airspace and presenting views in connection special airspace cases.

PRINTED IN U.S.A.

PRIOR TO HEADING for home bases in the U. S.'s newest states, two Fairchild F-27s give each a farewell salute over Hagerstown, Md. Aloha Airlines F-27 turboprop, the first to serve in the new 50th

State was headed for San Francisco and 2,400 miles of ocean to Hawaii. Wein Alaska Airlines' F-27 soon was to follow from the Fairchild factory for service in Alaska.

CESSNA AIRCRAFT reports that the new Mitchell transistorized auto-pilot is now available for installation in the twin-engined Cessna 310-C. Weight installed, exclusive of gyros, is 12.9 lbs. Said to require no warm-up time and use less power than the average cabin lights. Scheduled for delivery July 17 or later, is priced at.$2,965, as factory installed equipment on any Model 310-C.

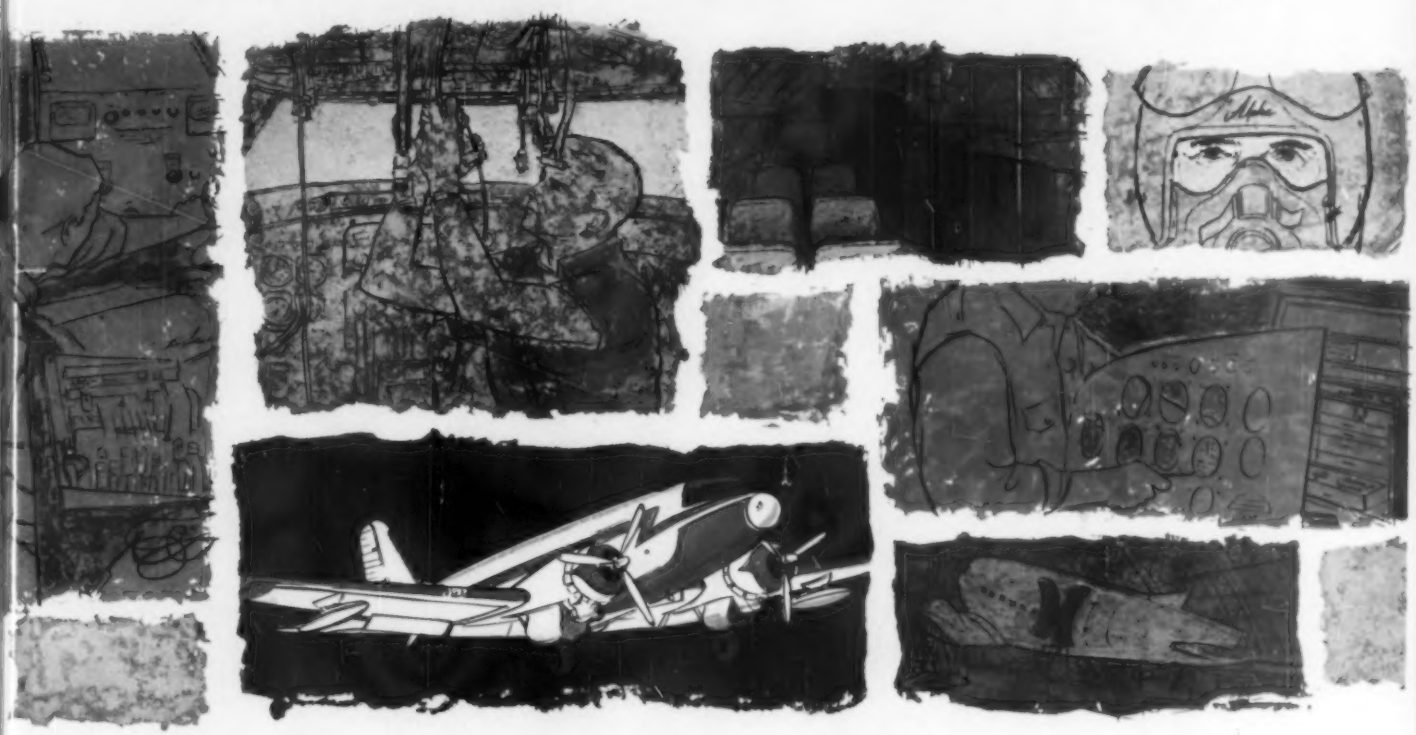
FEATURING THREE NEW SERIES of aircraft clocks for business aircraft, as well as airline transports, Sphinx-American Corp., 42 Cherry Lane, Floral Park, N. Y., has prepared a brochure describing the new "Flitelight" 13-jewel, eight-day models 53G (type A10A); 46G (A10 modified); and 46N (Type A10A modified). Prices and catalogue available on request.

SKI-EQUIPPED, this Piper Apache has been doing noble service in Alaska under the experienced hands of Dick McIntyre, bush pilot of note, owner and operator of the Frontier Flying Service in Fairbanks. The skis were fitted to the Apache by

the Fairbanks Aircraft Service, Piper dealer, and although they are said to cut the aircraft's speed down to about 136 mph, it can in winter months land in many off-beat places which would otherwise be completely inaccessible.

IN A RECENT successful flight of a U.S.-built ICBM, the first stage engine with its two thrust chambers, lifted a total weight of 110 tons—the equivalent of 12 city busses. The thrust of this engine equals the combined horsepower of 15,300 average-size American automobiles.

AIRCRAFT MODIFICATION



ALPHA MODIFICATION CENTER OFFERS COMPLETE SYSTEMS MANAGEMENT RESPONSIBILITY

One of the time-saving, packaged systems project services offered by Alpha Corporation is tip-to-tail modification of aircraft for both industry and government . . . in this country and abroad.

Whether you require the addition of simple or complex electronic equipment . . . or complete redesign and overhaul, including custom interior, Alpha Corporation Modification Center specialists will deliver a flight-tested, turnkey job to your specifications.

A notable example in the aircraft modification field is "Project Shirley" . . . a contract awarded Collins Radio Company by the United States Army Signal Corps. Starting with six surplus R4D aircraft (Navy versions of DC-3's) the airframes were reconstructed to meet exacting requirements imposed by the installation of extra complex electronic assemblies. Further, interiors were redesigned for extreme flexibility . . . including accommodation of seating or extensive airborne test equipment. These versatile "flying laboratories" exemplify the kind of complete, turnkey jobs Alpha handles at its Air Modification Center. Further, Alpha fabricates specialized equipment and installs it on client aircraft all over the free world.

Alpha was formed to extend and broaden the types of systems management work done for years by Collins Radio Company. This includes design, engineering and installation of space age communication systems complete with related roads, buildings and towers. The best available equipment from industry is used. Alpha trains client personnel or furnishes skilled crews for finished projects where needed.

Alpha . . . with its highly specialized organization of designers, engineers, scientists and constructors . . . is the sound, dependable answer to the need for proven skill with complete systems management responsibility.

Alpha CORPORATION
A SUBSIDIARY OF COLLINS RADIO COMPANY

DESIGNERS, ENGINEERS, CONSTRUCTORS, WORLD-WIDE • RICHARDSON, TEXAS • TELEPHONE DALLAS ADams 5-2323 • CABLE ADDRESS: ALPHA DALLAS

Alpha capabilities include technical systems management in all fields, with special emphasis on: • Space vehicle tracking and communication • Test range instrumentation and communications • Voice, teletype and data transmission • Aircraft modification and overhaul • Integrated shipborne, airborne, and ground communications • High capability remote control and switching

The Douglas DC-8 Jetliner alongside the specially designed Shell jet fuel truck.

AeroShell Turbine Fuel powers another great jet airliner

THIS MIGHTY GIANT of the Jet Age . . . The Douglas DC-8—will be America's newest jet airliner in passenger service this year. It is able to carry up to 176 passengers in smooth, quiet comfort.

Ready to serve *all* these new jets is AeroShell Turbine Fuel developed especially by Shell to meet the exacting fuel requirements of this new Jet Era.

Shell . . . the largest supplier of commercial jet fuel and aviation gasoline in the U. S. A . . . guards the quality of these fuels by special handling techniques, developed in Shell's unique AeroShell Turbine Fuel Equipment Laboratory.

WRITE FOR FREE LEAFLET

"FUELING THE DC-8"

This step-by-step picture story shows how the DC-8 is refueled.

SHELL OIL COMPANY

50 WEST 50th STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

SHELL